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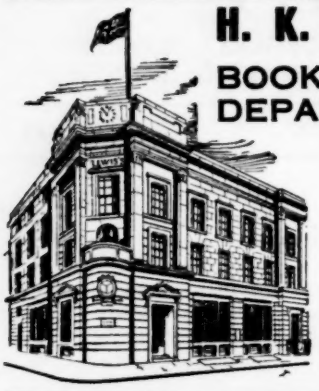

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ADDRESSES AND ORIGINAL ARTICLES

HÆMATEMESIS *

BY MAURICE E. SHAW, M.D. OXF., M.R.C.P. LOND.

ASSISTANT PHYSICIAN AND VICE-DEAN OF THE POST-GRADUATE COLLEGE, WEST LONDON HOSPITAL

I HAVE long been impressed by the fact that, although hæmatemesis is very frequently met with in the medical wards of a general hospital, in a large proportion of these cases no final diagnosis is made. It is common enough for a man or woman to be admitted with a large hæmatemesis. There may or may not be a history of dyspepsia; if there is, it is often vague, quite unlike the precise story of a chronic peptic ulcer. These patients generally get better quickly and are usually submitted to radiological examination within three weeks or so of their admission. If chronic ulcer, whether gastric or duodenal, were the common lesion in these patients one would expect to find a high proportion of them showing radiological signs of the disease. It is true that they have, as I have said, some three weeks in which to recover from the lesion which has caused their hæmorrhage, but experience shows that chronic peptic ulcers rarely heal in so short a time, and we should, I think, be justified in expecting a high proportion of positive ulcer findings from the radiological department. This has not been my experience, and I have therefore been led to the conclusion that chronic peptic ulcer is not as common a cause of hæmatemesis as has been supposed.

Personal experience is often misleading, and I have endeavoured to support my own opinion on the causes of hæmatemesis both by the records of this hospital and by the writings of other authors. I have ascertained that during the year 1932 28 cases were admitted to this hospital with a history of hæmatemesis. Of these, only 10 were found to be suffering from gastric ulcer, 2 from duodenal ulcer, and 2 from jejunal ulcer, while in as many as 11, or 39 per cent. of the whole, no cause could be found for the hæmorrhage.

Gutman and Demole [1] have recently reported a series of 100 cases admitted to the surgical clinic at the Salpêtrière in Paris for hæmatemesis. Of these only 19 were proved to have ulcers, while 21 had to be recorded as "undetermined" after the most minute investigation. A still larger series was reported last year by Rivers and Wilbur [2] from the Mayo Clinic in America. Out of 668 cases admitted for hæmatemesis in 1927 and 1928, a definite cause was allocated to all but 22 which gave an "ulcer history," but in which no evidence of ulcer could be found on radioscopic examination. It is very dangerous, however, to compare statistics from different sources, even though they appear to be dealing with exactly the same subject.

At first sight it would appear that the Americans are better diagnosticians than the French or English, for the former have admitted failure in diagnosis in a very small proportion of their large number of cases. But it must be obvious that the type of patient admitted to the Mayo Clinic is different in very many respects from the type admitted to a large general hospital in London or Paris. Acute cases must be almost unknown in Rochester, and certainly the type of hæmatemesis we see in this hospital, admitted within an hour of bringing up a pint or more of blood, can rarely find its way into a clinic such as the Mayo. Further, Gutman is writing of a surgical clinic, while my own figures have been derived from the total admissions, surgical and medical, for the year.

The figures of the Mayo Clinic are of little use for the purpose of this lecture, which is to examine the causes of hæmatemesis as a whole rather than the cause of hæmatemesis in a highly selected class of patient. For my purpose Gutman's figures are more useful and should be more comparable with the figures obtained here; 21 per cent. of Gutman's cases are recorded as undetermined as against 39 per cent. at the West London Hospital. This discrepancy may be due in part to the relatively small number of cases that I have submitted to analysis, but I think there are also other factors which help to explain it.

In the first place Gutman is concerned with cases admitted *for* hæmatemesis, while my cases include all those admitted *with a history* of hæmatemesis. Moreover, Gutman is inclined to include amongst the causes of hæmatemesis diseases which are certainly only indirectly responsible and which, in this country, might be taken as having nothing at all to do with it. For example, in 34 of his 100 cases the hæmorrhage is attributed to a secondary dyspepsia (appendix, gall-bladder) and in 7 to "gastritis." Such diagnoses (whether correct or not) are practically never made in this hospital in cases of hæmatemesis, and it is, therefore, justifiable to assume that they would be included in the group in which no cause was discovered. This would bring Gutman's group of undetermined cases up to 62 per cent.

Of my own 28 cases only 17 can be regarded as having been admitted "with" hæmatemesis—i.e., within three days of the hæmorrhage—and of these 10 (practically 60 per cent.) were of undetermined cause. There were 1 duodenal and 4 gastric ulcers in this group, the other 2 being due to cirrhosis and hyperpiesis respectively. There were, therefore, 30 per cent. of chronic ulcers in this small group of patients admitted to hospital actually with hæmatemesis, as compared with Gutman's 19 per cent. This certainly suggests that when we are called urgently to a large hæmatemesis the possibility of chronic peptic ulcer should not be allowed too prominent a place in the differential diagnosis.

The figures which I have quoted show—and this is a point which should never be lost sight of—how statistics vary according to the type of work being done at the clinic where they are collated. We have, however, two sets of statistics from two similar hospitals dealing with the same class of patient which are so closely parallel as to suggest that they are indicative of the true situation. Clearly, we must examine this large group—possibly 60 per cent. of all the cases of hæmatemesis—and try to find out what lesion or lesions are responsible for the hæmorrhage.

Causes of Hæmatemesis

Before doing this it will be instructive to consider the other definite causes of hæmatemesis, all of them due to organic diseases which are more or less easily diagnosed.

PEPTIC ULCER

Peptic ulcer is a common cause, though perhaps not the commonest. It would probably be true also to say that hæmatemesis is not a very common symptom of peptic ulcer. This is not really surprising, for chronic inflammatory lesions are not liable to hæmorrhage unless the inflammatory process is very rapid or the blood-vessel very large. If neither of these circumstances is present, the vessel usually thromboses before it is eroded and so hæmorrhage is avoided. It is interesting to note that in Gutman's series of 100 hæmatemeses 11 were duodenal and only 8

* A post-graduate lecture delivered at the West London Hospital.

gastric. This is contrary to the general belief that gastric ulcers cause hæmatemesis and duodenal ulcers melæna. In the West London Hospital during 1928 there were 95 cases of peptic ulcer admitted to the medical and surgical wards. Of these, 46 were gastric and 49 duodenal. Hæmatemesis occurred in 10 of the gastric and in only 2 of the duodenal, this series therefore confirming the popular belief. But it should be noted that of nearly 100 ulcer cases admitted there was only a history of hæmatemesis in 12 (an incidence of nearly 12 per cent.). Gutman went over 100 consecutive cases of peptic ulcer submitted to operation and found that in only 32 was there any history of hæmorrhage.

There are three sorts of peptic ulcer which bleed: gastric, duodenal and jejunal. Of the 28 cases admitted to this hospital last year with a history of hæmatemesis, 10 had gastric, 2 duodenal and 2 jejunal ulcer, so that, according to this small collection, jejunal and duodenal ulcer are equally frequent as a cause of hæmorrhage. In Gutman's series 8 per cent. are recorded as "post-operative" hæmorrhages, which is approximately the same proportion as the West London figures, and it is interesting to see that he finds the same number of hæmatemeses caused by jejunal as by primary gastric ulcer. I should doubt whether this is the experience of most general hospital clinics, but I think it emphasises an important point—namely, the relative frequency of hæmorrhage as an after-result of gastro-enterostomy.

Of the cases admitted to the West London last year no less than four had had operations on their stomachs in the past, and two of them were found to have gastric ulcers for which the operation had not been successful. (In neither of these two latter cases had a partial gastrectomy been done.) The two others have been recorded as jejunal ulcer, although they might equally well be included in the "undetermined" group as far as the radiological evidence went, for in neither was there any definite evidence of a jejunal ulcer. I have assumed, however, that the hæmorrhage came from the anastomosis, because Gutman has grouped all such cases together as "post-operative," and I have tried to make my figures as closely comparable with his as possible.

The diagnosis of these ulcers is made by a combination of the history with the physical and radiological signs. Of these the radiological are the most important, for without some positive evidence on the radiological side—always assuming that the examination has been carried out by an experienced radiologist—it must be considered doubtful whether a chronic ulcer can be present. Radiological technique has advanced so much of recent years that it is safe to assume that very few ulcers are missed. No method of examination is infallible, but when an ulcer, or some abnormality indicating an ulcer, cannot be found after thorough and expert examination, some other cause of the hæmatemesis must be sought. The history is likely to be more informative than the physical examination, because most cases of ulcer, although not by any means all, give a characteristic history. On the other hand, physical signs are as frequently absent as present—perhaps even more frequently. But when they are present they may provide very useful information.

If a chronic ulcer bleeds it will not be possible, unless the hæmorrhage is very small, to submit the patient to full investigation at once. In an average case three weeks must elapse, but, as I have already pointed out, it is unlikely that a chronic ulcer will heal in so short a space of time, and some abnormal radiological signs are almost certain to be present if such an ulcer is the cause of the hæmorrhage. It is improbable that more than about 40 per cent. of all cases of hæmatemesis will give such signs.

CIRRHOSIS OF THE LIVER

Cirrhosis is one of the next most common causes of hæmatemesis. The fact that cases of so-called splenic anæmia also develop cirrhosis of the liver makes it a little difficult to disentangle these two groups, which together are responsible for quite a large number of cases of gastric hæmorrhage. Of our 28 cases here only one was certainly due to cirrhosis; this patient died and the diagnosis was confirmed in the post-mortem room. On the other hand, the diagnosis is not easy to make unless the patient exhibits the classical signs, and it is quite likely that a certain number of the "undetermined" group are really cases of cirrhosis. I do not think that sufficient attention is paid to the possibility of cirrhosis in middle-aged patients suffering from hæmatemesis of obscure origin. We are apt to dismiss the disease after satisfying ourselves of the sobriety of the patient; but alcohol is not by any means a necessary factor in the ætiology of cirrhosis. It is true that alcoholics get cirrhosis more frequently than sober people, but so they do many other diseases. If all cases of cirrhosis were investigated we should find a surprisingly high proportion in temperate, and even in teetotal, patients.

It is unfortunate that we have no really satisfactory test for hepatic function, but I believe that the lævulose test, although it cannot be considered very delicate, is well worth using when cirrhosis of the liver is being considered and when the clinical signs are equivocal. In quite a number of cases I have had help from this test and have, rightly or wrongly, attributed a hæmatemesis to cirrhosis which would otherwise have had to be classified as of unknown cause.

Rivers and Wilbur found only 12 cases of cirrhosis in their total of 668 cases of hæmatemesis at the Mayo Clinic. But it must be remembered that cases which had already been diagnosed as cirrhosis would not be likely to be sent to the Clinic, as they would not be suitable for treatment there. The total of 2 per cent. is therefore probably an underestimate of the frequency with which cirrhosis causes hæmatemesis. The one West London case, out of a total of 28, gives a percentage of approximately 3·5, and Gutman found 5 per cent. I have an impression, based upon several months spent working in a Paris hospital, that cirrhosis is a good deal more common in France than in this country, and I do not think we should conclude that more than 5 per cent. of all cases of hæmatemesis are due to cirrhosis.

ASSOCIATED WITH SPLENOMEGALY

The other important group is one which I think is best called hæmatemesis with splenomegaly. I prefer to avoid more precise terms, such as Banti's disease or splenic anæmia, because I feel that we are dealing with a large group of cases whose pathology is not properly understood and whose clinical differentiation is far from clear. The fact remains, however, that splenomegalic patients get hæmatemesis, and that such patients may later develop cirrhosis of the liver and acquire the clinical picture of Banti's disease. It has long been the custom to speak of patients who have a moderately enlarged spleen and a "secondary" type of anæmia with a leucopenia as suffering from "splenic anæmia." It is no part of my present purpose to enter upon a discussion of this obscure but interesting hæmatological problem. The point of importance is that certain patients with enlarged spleens are especially liable to gastric hæmorrhage.

The type of enlarged spleen which seems particularly to be associated with hæmatemesis is the type found in Banti's disease, and this spleen, as a result of fibrosis, loses much of its elasticity and contractility. A possible explanation of these hæmorrhages is that one function of the spleen is to regulate the portal pressure by its power of contracting

and expanding. If it loses this power, as it certainly does in the conditions we are considering, there is no mechanism to compensate for sudden rises in portal pressure, which might then lead to congestion and rupture of vessels. Villaret,[3] over 25 years ago, did some experiments showing that the spleen does exercise this regulating effect upon the portal circulation, and he believes [4] that it is the loss of this which causes portal "hypertension" and consequent hæmorrhage in splenomegalic patients. Fiessinger [5] appears to believe that the back pressure is on the arterial side. The radicals of the splenic artery are obstructed spleenwards and so the pressure rises in the vessels supplying the gastric mucosa. Cure will be achieved if the spleen is removed, provided that cirrhosis of the liver has not yet set in.

French writers have specially interested themselves in this type of gastric hæmorrhage and believe that it may be much more common than is generally supposed.[6 7] They point out that a large spleen is not necessarily palpable and suggest that many of the obscure cases of hæmatemesis may be due to this cause. If the disease is in its early stages it will not be easy to diagnose. But the diagnosis is important, as removal of the spleen offers a prospect of complete cure. It is essential that splenectomy should be performed early, for the onset of cirrhosis will render it useless, but there does not appear to be, as yet, any certain way to establish the diagnosis before the spleen has enlarged sufficiently to become palpable.

The important practical point that arises from this discussion is that enlargement of the spleen must not be forgotten, and must be carefully searched for in all cases of hæmatemesis. The fact that a spleen is palpable at all, even with the greatest difficulty, is evidence that it is enlarged, and where this enlargement is associated with hæmatemesis, and it is clear that there is no primary blood condition—e.g., leukæmia—to account for it, the question of splenectomy must be seriously considered.

Only one of the 28 West London cases was diagnosed as splenic anæmia, which is probably the same thing as saying that only one case had a palpable spleen. Gutman had none in his series, but this might be accounted for by the fact that his was a surgical clinic—although it is perhaps surprising that none were sent to him under misapprehension. In the Mayo Clinic group reported by Rivers and Wilbur nearly 3 per cent. are recorded as "splenic anæmia." Of these by far the largest number was submitted to operation.

I do not wish to encourage the resort to splenectomy in all cases of obscure hæmatemesis. But the possible existence of some form of splenic disease should be considered in all such cases, and a careful search for enlargement of this organ should be made. If no enlargement can be found, the possibility of an early stage of the disease should be entertained and a careful watch kept for the first sign of splenomegaly. The blood picture is not particularly helpful, as the anæmia is so similar to that caused by loss of blood. But the presence of a definite and persistent leucopenia is very suggestive.

LESS USUAL CAUSES

Malignant disease.—These three groups—peptic ulcer, cirrhosis, and splenomegaly—account for the vast majority of the cases of hæmatemesis in which a definite diagnosis is commonly made. A fourth group might be made of malignant disease of the stomach, but hæmatemesis, in the sense of a brisk hæmorrhage, is not common in this disease. The presence of blood in the vomited matter, usually of the "coffee-ground" variety, is quite common, but this is hardly what is generally meant by hæmatemesis. However, at the Mayo Clinic 13 per cent. of the 668 cases analysed by Rivers and Wilbur were found to have carcinoma; Gutman found 3 per cent. Of the West London cases quoted, there were none with a definite history of hæmatemesis who were found to have carcinoma, but on looking up the admissions for carcinoma of the stomach for the year I found that three out of 18 (some 14 per cent.) had a history of having vomited material containing recognisable blood.

Rare causes.—There are, of course, a number of comparatively rare causes of hæmatemesis, but these need not detain us long. Syphilis, tuberculosis, and benign tumours of the stomach have all been described from time to time, and occasionally give rise to hæmorrhage. Blood diseases, such as purpura hæmorrhagica, leukæmia, and hæmophilia are rare causes, and are not likely to give much difficulty in diagnosis. Cases have been described associated with hæmorrhagic telangiectases of the skin (the hereditary form described by Osler), and it has been suggested that similar lesions in the mucosa of the stomach are responsible for the hæmorrhage. Some of these cases have an increased coagulation time, and this is an investigation which is worth while doing in all obscure cases. High blood pressure is probably responsible for a certain number of cases of gastro-duodenal hæmorrhage, and one such case is included in the 28 cases admitted to this hospital last year. The pressure is recorded as 172/130. The high diastolic pressure suggests that the systolic may have been a good deal higher before the hæmorrhage. Unfortunately no information is available on this point. Rare causes of hæmatemesis could doubtless be multiplied, but I think I have indicated the most likely ones.

The Cause in Unclassified Cases

We are now confronted with the interesting but difficult problem of assigning some cause to the cases of hæmatemesis which cannot be classified under any of the above headings—a very substantial percentage of the whole. The cases may be divided roughly into those in which some disease is present, not necessarily having any direct bearing upon the source of the hæmorrhage, and those in whom there is no discoverable disease at all (apart from any anæmia that may have resulted from the hæmorrhage). It is difficult to divide the cases at this hospital into these two groups, because the patients rarely stay in long enough to be submitted to the extensive investigation which can alone exclude the presence of any sort of disease. The shortage of beds and the length of our waiting-lists is the explanation of this state of affairs. In France, however, conditions are different, and in all the cases quoted by Gutman the most extensive investigations were carried out, with the result that in all but 21 cases (21 per cent.) some disease was found to which the hæmorrhage might be *indirectly* attributable.

Some 41 per cent. of these cases were found to be suffering from secondary dyspepsia or gastritis. Now dyspepsia secondary to gall-bladder or appendicular disease (or to both—for they are commonly associated) is well known, and the condition is widely recognised in this country as well as on the continent and in America. A renewed interest in the subject of gastritis and duodenitis has arisen since the recognition of these conditions at operation and the description of their pathology by Konjetzny,[8] Faber,[9] and others. There can be no doubt that duodenitis and gastritis occur both by themselves and in association with chronic and acute ulcers. And it seems likely that they may give rise to hæmorrhage. Nagel [10] has recorded 26 cases of this condition at the Mayo Clinic, and six of them suffered from hæmorrhage. The question then arises whether the hæmorrhage is diffuse or from a definite localised area such as an acute ulcer.

THE ACUTE ULCER

In using the term "acute" ulcer I should like to explain exactly what is meant by this word.

Ulcers may be divided into acute, subacute, and chronic. The evidence upon which their classification is based is

mainly pathological and depends in part upon the extent to which the walls of the viscus have been penetrated. As a rule, an acute ulcer does not penetrate the muscular layer of the stomach or duodenum. Such ulcers are, in fact, superficial, and the pathological changes found on microscopical examination are not such as to justify the use of the term "chronic" in its pathological sense. It must be realised that "acute" and "chronic" are pathological as well as clinical terms and, in relation to ulcers, they are used here in the pathological sense. Rarely an ulcer may penetrate all the layers of the stomach and duodenal walls without giving rise to any "chronic" pathological changes; in other words an acute ulcer may perforate although it rarely does so.

Moreover, acute ulcers are nearly always multiple and they tend to heal very readily. Stewart [11] has shown that these ulcers are commonly found in association with infection and inflammatory lesions; inflammation of the gall-bladder and appendix is particularly apt to be associated with acute ulceration in the stomach and duodenum. Acute ulcers are apt to bleed simply because they are likely to erode a small vessel before that vessel has time to thrombose. The probability is that only a very small proportion of acute ulcers bleed, but I think it is likely that they account for a very large number of all cases of hæmatemesis.

There has been a good deal of confusion about the nomenclature of these lesions. Simple erosion, superficial erosion, and hæmorrhagic erosion are all used, and it is not yet decided whether they all refer to the same condition in different stages of its existence or to different entities. Personally, I incline to the view that all are stages of the same lesion. All chronic ulcers start as acute ones, but all acute ones do not become chronic. It is not part of my present subject to deal with the question of what determines whether a given acute ulcer becomes chronic or heals. But I should like briefly to indicate my belief that the constitution of the individual is one of the determining factors. Certain people are born with ulcer constitutions—the "ulcer race" of Draper—and if these acquire acute ulcers they are very likely to become chronic. On the other hand, if a person with some other type of constitution develops an acute ulcer the chances are that that ulcer will heal and not become chronic. The point of importance in relation to the subject of my lecture is that the acute ulcer, whatever the constitution of the individual, is likely to bleed.

Aschoff [12] describes two varieties of acute ulcer: erosions of the fundus and erosions of the lesser curvature. The former are very widely distributed and are often present in fairly large numbers. It is clear that they do not often become chronic, because chronic ulcers are rarely found outside the lesser curvature. It is therefore probable that the lesser curvature type of acute ulcer is the one that most usually becomes chronic, and there are anatomical reasons for supposing that this is so. The source of the blood-supply and the arrangement of the musculature are different in these two localities, and it is to these differences that the distinction between the two types of ulcer is attributed. The fundus erosions are smaller than those of the lesser curvature but the latter, although frequently multiple, are usually fewer in number. Aschoff does not believe that the two types are often associated in the same individual. If this is so, it is probably accounted for by the constitution of the patient. But it is clear that some form of acute ulcer may occur in any type of individual, and they are all likely to bleed if the ulcerative process causes a breach in a vessel.

Gutman attributes 41 per cent. of his cases of hæmatemesis to secondary dyspepsias and gastritis. He gives no clear account of how such lesions in other organs lead to gastric hæmorrhage, and I suggest that these cases are really cases of acute ulceration, either of stomach or duodenum (or perhaps of both), the appendicitis or cholecystitis being merely the origin of the infective factor producing the ulceration.

I am prepared to admit that a localised gastritis or duodenitis may be hæmorrhagic and bleed, without any discoverable ulcer. But this is really only a matter of degree. The bleeding must come from somewhere, and there must be a breach in the wall of a vessel to allow the blood to escape. If the lesion is large enough to be seen we call it an acute ulcer. If it is too small to be seen, and perhaps multiple, we have to take refuge in some other term, and duodenitis is as good a one as any. The real point is that hæmorrhage commonly comes from an acute lesion of the gastro-duodenal mucosa, be that lesion localised or diffuse.

Bortz,[13] of Philadelphia, in a paper published last year, quotes a case described by Alvarez, in his recent book on nervous dyspepsia, of an inventor who had a hæmatemesis every time his invention failed—namely, six times in three years. This is quoted as evidence that emotional strain may be a cause of diffuse gastric hæmorrhage, but it does not seem to me to be at all conclusive. I can still imagine that the hæmorrhages might have been due to acute ulcers whose activity was stimulated by irregularities of diet (or drink!) after the recurring failures of the invention.

Bortz quotes Hale-White's writings on gastric hæmorrhage, and no English writer, particularly if he owes his education to the medical school of Guy's Hospital, can fail to take note of these important contributions to the study of hæmatemesis. Hale-White seems to have been the first person to recognise that hæmatemesis was a commoner disease than gastric ulcer. At the time he was writing—his papers were published in THE LANCET in 1901 [14] and 1906 [15]—X rays were in their infancy, and the diagnosis of ulcer was made by purely clinical methods. Hale-White considered, from his experience in the post-mortem room, that gastric ulcer (in what we should now call the chronic form) was not a particularly common disease, but he had noticed that hæmatemesis was a very common cause of admission into the medical wards. And in some of the rare cases when this hæmatemesis had been fatal he had failed to find any evidence of ulcer in the post-mortem room. He had, however, noticed a diffuse congestion of the mucosa in these cases, and had concluded that the hæmorrhage came from a capillary oozing to which the name gastrostaxis was given—a name which is still widely used.

It seems to me to be more likely that this form of hæmorrhage is really due to acute ulceration—possibly associated with some form of gastritis. The acute ulcers are not easy to find, and would almost certainly be missed by anyone unfamiliar with their appearance and who was not actually looking for them. I would not go so far as to say that true diffuse hæmorrhage from the stomach does not take place, but I believe that most cases in which this has been thought in the past to be the cause of hæmorrhage are really cases of small acute ulcers—often multiple, and of such minute proportions as to escape the eye of the morbid anatomist.

There is one other point about these acute ulcers, and it is a point of special importance in connexion with the treatment of hæmatemesis. Acute ulcers have often been noted in association with chronic ones. It is possible that the chronic ulcer is one of a number of acute ones which has become chronic, or it may be that the acute ones are caused by the irritation and infection of the adjacent chronic process. I have already mentioned my belief that the acute inflammatory process is more likely to give rise to hæmorrhage than the chronic, and if this is so it follows that the acute ulcer is more likely to bleed than the chronic, even when the two are associated. If a patient with a known chronic ulcer has a hæmatemesis there is a distinct possibility that the hæmorrhage is coming from a complicating acute ulcer and not from the chronic one at all.

In 89 cases of gastric ulcer examined at autopsy by Stewart [16] 6·7 per cent. were accompanied by acute ulcers. In the duodenal group, of which there was a larger total number (153 cases in all), the incidence of acute ulcer was 11·8 per cent., one-third of these being duodenal and the rest gastric. In two of the gastric cases it is said that "hæmorrhage from one of the acute ulcers appeared to be the immediate

cause of death." Incidentally it is interesting to note that acute gastric ulcer is a not uncommon complicating lesion in chronic duodenal ulcer, and this suggests one reason for the relative frequency of hæmatemesis, rather than melæna, in duodenal ulcer. In Gutman's series of cases duodenal ulcer was found more often than gastric.

I hope I have said enough to show that acute ulceration of the stomach or duodenum is a common, if not the commonest, cause of hæmatemesis. In those cases in which hæmatemesis comes unheralded by classical ulcer symptoms, and in which full investigation reveals no lesion of the stomach or duodenum, we have to consider first the possibility of cirrhosis of the liver or disease of the spleen. If these can be excluded we are left with acute ulcer as the most likely cause, and it only remains to account for the presence of this lesion. Infection is the probable cause, and this must be most diligently searched for and, if possible, eliminated. Particularly important in this respect are the gall-bladder and appendix. But the teeth, tonsils, and accessory sinuses must not escape consideration and, wherever infection is found, it must be adequately dealt with. This view of gastric hæmorrhage explains Gutman's findings of secondary dyspepsia as a common cause of hæmatemesis, for these dyspepsias, depending as they do mainly upon lesions of the gall-bladder and appendix, are specially likely to be accompanied by acute ulceration. Even when chronic ulcer is proved to be present there is no means of proving that the hæmorrhage comes from this source. I do not suggest that bleeding must never be attributed to a chronic ulcer. When the latter lesion is shown to exist it is the most probable source of the hæmorrhage. But I do want to emphasise that even though the chronic ulcer is present it does not follow that the hæmorrhage may not come from an incidental acute ulcer.

Prognosis

In the experience of most observers the prognosis is very favourable. Of the 28 cases that I have quoted from this hospital only one died as a result of the hæmorrhage, and that was the case of cirrhosis of the liver—and I believe that the prognosis in hæmatemesis from cirrhosis is far graver than from acute or chronic ulcer. One other patient died, but this was due to post-operative pulmonary embolism. I have also obtained the figures relating to the admissions at another hospital to which I am attached. Last year there were ten admissions for hæmatemesis, of whom one died. This death was due to the perforation of a vessel by an acute ulcer. So that out of a total of 38 cases there were two deaths directly attributable to hæmorrhage (approximately 5 per cent.). If we eliminate the cases in which it is clear that neither acute nor chronic ulcer was responsible for the hæmorrhage, the death-rate was only 1 in 35 (or approximately 3 per cent.). This figure is in general agreement with the figures given by Hurst [17] from Conybeare's investigation of 600 admissions for hæmorrhage at Guy's Hospital (2·5 per cent. mortality), and I think we may safely conclude that not more than 3 per cent. of all cases of hæmatemesis from ulcer (acute and chronic) will succumb to the hæmorrhage. Improvement in the treatment of hæmorrhage, especially the provision at all hospitals of the facilities for immediate blood transfusion, must have reduced the mortality very considerably in recent years.

Treatment

The fact that the mortality from hæmorrhage of this sort is low does not mean that treatment is unimportant. Thorough and prompt treatment is essential if successful results are to be obtained. As in all cases of hæmorrhage, rest is of first importance. This is secured by morphia, which must be given in adequate doses. An initial dose of gr. ½ is not too much if the patient is heavy, and only in the smallest patients should as little as gr. ¼ be given. Atropine gr. 1/100 should be given at the same time in order to prevent, as far as possible, the secretion of hydrochloric acid.

Rectal feeding should be instituted and continued, nothing but ice being given by the mouth until the hæmorrhage has been arrested. The hygiene of the mouth must be carefully preserved to eliminate the very real risk of parotitis. The value of ice has probably been over-rated, but I think it is worth giving, as it tends to stimulate a flow of saliva and counteracts any tendency to dryness of the mouth, which is particularly likely to be present if atropine is being given. It is not likely to have any direct effect upon the bleeding point, but it is comforting to the patient and can do no possible harm. The rectal feeds should consist of glucose-saline solution: 15 oz. of a 4 per cent. or 5 per cent. solution of glucose in normal saline are given about every six hours, and once a day an enema should be given. Without this the absorption of the glucose and saline is not so efficient.

The value of washing out the stomach is not sufficiently appreciated. If carefully done there is no risk of disturbing the bleeding point, and the emptying of the stomach increases the chance of arresting the hæmorrhage. A large blood clot in the stomach acts in the same way as food, and being protein it provokes a secretion of gastric juice as well as stimulating gastric motility. If this can be removed, immobilisation of the stomach is secured, and the muscle will contract down and assist in the arrest of the hæmorrhage. An ordinary large-size stomach-tube is used, and is passed only as far as the cardiac orifice. The use of Senoran's evacuator, as recommended by Hurst, is a great help, but if this is not available the ordinary funnel can be employed. The stomach is washed out with small quantities of iced water, not more than 4 oz. at a time, until the fluid returned is perfectly clear. A styptic solution such as ferric chloride (1 in 1000) may be used, but I doubt whether it is of very much use. When the stomach is clean and free from blood it should be completely emptied and a few drachms of adrenaline run in. There is no risk of over-dosage or of increasing the blood pressure, for adrenaline is quite inactive when given in this way, although it will have a local effect and tend to constrict the blood-vessels.

Some form of alkali should be given, and the best is the tribasic phosphate of magnesium; 1 drachm may be given every hour as long as the patient is awake.

Before any of these measures are adopted (except morphia) the blood group should be determined and the hæmoglobin estimated. It is difficult to give any definite rule as to the indications for transfusion, but it is certainly required if the hæmoglobin falls to 20 per cent. or less, or if the red cell count is below 1,000,000. Hurst recommends transfusion if the hæmoglobin falls below 40 per cent., and if the hæmorrhage appears to be continuing this is probably a good rule. But if the indications provided by the pulse-rate and blood pressure show that the hæmorrhage has probably been arrested there is no need to resort to transfusion, as a patient with an anæmia of this degree is quite capable of recovering with less heroic measures.

The secondary anæmias from which these patients suffer are not accompanied by any fall in blood calcium and there is, therefore, no need to give calcium by injection. Other reputed remedies for arresting hæmorrhage, such as hæmostatic serum, are of doubtful utility, and the best that can be said of them is that they probably do little harm. On theoretical grounds it is unlikely that serum can have the slightest effect in increasing the coagulability of the blood unless given in doses which would be dangerous.

As soon as the hæmorrhage has been arrested, and has remained arrested for 24 hours, feeding by mouth can be begun. It is surprising how soon the hæmorrhage will stop even after quite a considerable hæmatemesis. I have known the occult blood test become negative in less than a week after a large hæmatemesis of over a pint. But it is not necessary to wait for the occult blood to disappear from the stools. Cessation of hæmatemesis and melæna, a steady pulse, and a rising blood pressure and hæmoglobin percentage are the most useful criteria for determining the time of arrest. It is best to assume that one is dealing with a chronic ulcer and to give a diet accordingly. Any of the recognised ulcer diets answers the purpose, but personally I prefer that described by Hurst.

I believe that it is usually safe to examine the patient radiologically within a fortnight of the cessation of hæmorrhage, provided that the patient's general condition is reasonably good. Sometimes it may be advisable to wait a little longer, especially as the examination will lose much of its value if the patient cannot stand for a few minutes. For this reason I often have the patients got up for a few days before radioscopy, so that they may recover sufficient strength in their legs. But I like to have them examined as early as possible, so that a chronic ulcer, if it is responsible for the hæmorrhage, may not have time to heal. Obviously a certain amount of judgment is necessary in deciding exactly when to proceed with the investigations.

SURGICAL TREATMENT

You will notice that I have said nothing about surgery in the treatment of hæmatemesis. Some years ago it was commonly practised, but the results have not encouraged its more extensive use. I have already shown that the prognosis is good with efficient medical treatment, and patients with severe hæmorrhages are not good surgical risks. Unless one can be certain that one is going rapidly to find the source of the hæmorrhage, and equally rapidly to arrest it, surgical interference is not justified. And when can we be certain of either of these things? We rarely have to deal with a patient in whom a chronic ulcer is *known* to exist at the time of the onset of the hæmorrhage. Even the history may be misleading, assuming that the patient is in a condition to give an accurate history. If the bleeding is from any other source than a chronic ulcer—e.g., acute ulcer, œsophageal varix, splenic anæmia—surgery is bound to fail, for the lesion will not be found. In old days it was a common experience for surgeons to explore these cases and find nothing. Laparotomy does not improve the condition of a patient already depleted of blood, and he should not be submitted to this risk without the fullest expectation that something useful can be done. Assuming, however, that we have to deal with a patient who is known to be suffering from a chronic ulcer, who perhaps has recently been radiographed and had the ulcer clearly demonstrated, we should still hesitate to advise operation, because it may not be the chronic ulcer that is bleeding. It is impossible to exclude a complicating acute ulcer as the cause of the hæmorrhage, and such an ulcer would never be found at operation.

What good is it to deal with the known lesion and leave the unknown which is the cause of all the trouble? Surgeons have frequently operated and left the patient with no possibility of hæmorrhage from the chronic ulcer, which has been found, and yet the hæmorrhage has continued. Hurst [18] describes a case in which he advised operation, and a large ulcer was found on the posterior wall of the duodenum. "The gastro-duodenal and right gastro-epiploic arteries were tied, the ulcer invaginated with catgut sutures, and a gastro-jejunostomy was performed. The hæmorrhage, however, continued, and in spite of two transfusions he died the following day." Theoretically the ideal case for operation is the large chronic ulcer with an atheromatous vessel whose wall is unlikely to contract and so allow of spontaneous arrest by thrombosis. But it is almost impossible to determine in advance that these conditions will be found, and such an ulcer is likely to bleed so rapidly that a fatal outcome will occur before operation can be considered. However, in a patient of middle age, with definite evidence of arterio-sclerosis and equally definite evidence of chronic ulcer, operation might be justified if the hæmorrhage persisted in spite of thorough medical treatment, including transfusion. But that is about the only type of case in which, personally, I should even consider advising operation.

When the patient has recovered from his hæmatemesis the question may arise as to whether he should be operated upon to prevent a recurrence. The indications here are the same as the indications for operation in peptic ulcer generally, and I cannot go into them. Operation, however, does not by any means eliminate the risk of hæmorrhage. I see plenty of patients who have considerable hæmorrhages many years after operations for gastric and duodenal ulcers. I knew a man of a little over 40 years of age who died of such a hæmorrhage more than 20 years after an operation for duodenal ulcer. He had had attacks of melæna at intervals for many years before one of these proved fatal. If the practitioner advises his patients to submit to operation because they have had a hæmatemesis, he must not imagine that they will necessarily be immune in the future. There appear to be some patients who are particularly liable to hæmorrhage, and these are perhaps as likely to bleed after operation as before. My own view is that the indications for operation after hæmorrhage are precisely the same as the indications before.

I have tried to show that hæmatemesis is far less often directly due to chronic peptic ulcer than is commonly supposed. I believe that acute ulcer is a much more common cause, and that this may be the cause even when a chronic ulcer is also present. For this and other reasons which I have given I believe that the treatment of hæmatemesis is medical, and that surgical intervention is only indicated in exceptional cases. The safe rule is never to operate for hæmatemesis at all. Practitioners who follow this rule will, I am confident, save more lives than they will lose.

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CURRENT THEORIES OF THE ÆTIOLOGY OF PELLAGRA *

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The ætiology of pellagra may seem a strange subject for a lecture by one who has no experience of the disease and is not even a clinician. My reason for this choice is that many of the problems in nutrition studied in recent years by the group working on nutrition at the Lister Institute have touched closely some of the subjects involved in the current theories of the ætiology of this disease.

I do not propose to deal with theories which have been advanced to explain the causation of pellagra other than those which are dietetic or nutritional in character. To those like myself whose knowledge is derived from a study of the literature, the case seems settled in favour of a dietetic theory. The various theories which have been put forward from time to time involving an infective agent, have received no continued support or confirmation, and the following facts seem to admit of only one origin, a nutritional origin, for the disease :—

(1) The lack of any evidence of spread of the disease among contacts not receiving the same diet; (2) the absence of recorded instances of nurses and doctors contracting the disease from the patients attended by them; (3) the observed recovery of patients receiving an "improved" diet in hospital, without other treatment, and the failure to do so on an "inferior" diet.

The final proof would seem to be contained in the long series of researches carried out by Goldberger and his colleagues,[1 2 3] showing that pellagra can be prevented or cured in populations among which the disease is endemic by adding to the diet in sufficient quantity even one only of certain simple foodstuffs, such as meat, milk, tomatoes, wheat embryo, or yeast. The situation has been well summarised in a recent paper of Wheeler and Sebrell.[4]

In the attempts which have been made to determine the exact defect in diet by which pellagra is caused, there are three well-established facts which have formed the basis for special study :—

1. Pellagra is a disease of poor people in rural districts, subsisting on a limited choice of food, and is rarely, if ever, seen among the well-to-do, who enjoy a richer or more varied diet.

2. It is almost invariably associated with the use of maize as a staple cereal in diet, and its occurrence in populations subsisting mainly on wheat or rice is something of a rarity, though well-authenticated cases have been reported.[5 6] The occurrence of pellagra in recent years in the United States as the result of severe alcoholism appears, at first sight, to be another exception to the above rule; it may, however, prove to be otherwise (see below p. 346).

3. It is a disease of warm and sunny countries, a fact which may, however, be partly connected with the fact that maize is often the cheapest cereal in such localities, as, for example, in Egypt, Italy, Rumania, and the Southern United States, where pellagra is prevalent.

The above facts must be satisfactorily accounted for in any theory which professes to explain the ætiology of pellagra, and it is especially the connexion of the disease with the consumption of maize which will form the subject of this paper. For it is just in this respect that the two main theories which are current to-day break down. These are, first, the theory connecting pellagra with an amino-acid deficiency in diet; and, secondly, that associating the disease with a vitamin deficiency.

The Theory of Amino-acid Deficiency

The association of pellagra with maize consumption led naturally to the conclusion that the disease might be caused by a lack of protein of high biological value; in other words, by a deficiency in the diet of certain essential amino-acids. The proteins of maize have been shown to consist, to the extent of 58 per cent., of zein,[7] the notoriously incomplete protein lacking the important amino-acids tryptophane and lysine. The work on zein of Willcock and Hopkins,[8] and of Osborne and Mendel,[9] which is too well known to need description, showed conclusively that young animals fed on diets containing zein as the sole source of protein could not maintain their weight unless tryptophane was added, and were unable to grow unless lysine was given.

Zein is thus a protein of low nutritive value incapable of replacing completely the daily nitrogenous waste of the body. Maize glutelin, which forms 36 per cent. of the protein in maize,[7] is, however, more complete in the essentials in which zein is lacking, and tends to supplement the latter, when maize is consumed.

Animal proteins as a class contain a more varied assortment of amino-acids than vegetable proteins (e.g., those of cereals, vegetables, and legumes), and in this respect may be assumed to resemble more closely those contained in the tissues of the animal they are used to nourish. It is generally true that nitrogenous equilibrium can be obtained on a smaller intake of animal, than of vegetable, protein; in other words, animal proteins have a higher biological value. The observed good effect on pellagra of adding meat, milk, and eggs to the dietary can therefore readily be explained as due to the advantage of giving a richer variety of essential amino-acids.

The theory that pellagra is developed on a maize diet as the direct result of an amino-acid deficiency is therefore a reasonable and attractive hypothesis, and the last 20 years have seen many laborious investigations carried out with the object of determining the relative biological value of the proteins of the commoner foodstuffs. The experimental work has been of two types: (1) comparison of the minimal proportion of different proteins required in a dietary, as the sole source of nitrogen, in order that young animals may be reared to maturity; (2) short-term metabolic observations in which determination is made of the minimal intake of different proteins required to maintain nitrogenous equilibrium.

* De Lamar lecture, delivered at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, on Nov. 15th, 1932.

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(1) Among experiments of the first type are the extensive pioneer series with purified proteins carried out on rats by Osborne and Mendel,[10] which revealed the deficiencies of certain amino-acids in certain proteins—e.g., of cystine in casein, and of lysine in edestin and wheat gliadin. The work of McCollum and his co-workers [11] has a special value in that the experiments lasted long enough to include reproduction and lactation. In their work determination was made of the minimum amounts of various foodstuffs required to support these functions, when providing the sole source of protein in the diets, which were similar as regards other elements. The results obtained are summarised in Table I., where the foodstuffs are arranged in the order of their

TABLE I

Relative Biological Value of Proteins

Criterion.	Growth, reproduction, lactation.	Maintenance of weight.
Animal..	Rat.	Rat. Pig.
	1. Ox-kidney (9% protein in the diet). 2. Whole wheat (9%)* 3. Milk; ox liver. 4. Barley; rye; ox muscle (14%). 5. Maize; oats. 6. Soy bean; navy bean; pea.	— Wheat and maize about equal.
Authority.	McCollum and others, 1921.	McCollum and Simmonds, 1917. Hart and McCollum, 1914.

* Young not successfully reared.

biological value. They show the high place taken by the proteins of whole wheat—above those of milk and nearly equal to those of ox-kidney—the relatively low place taken by meat (muscle), and the low value given to the proteins of maize. For maintenance of weight only, in young rats, the proteins of whole wheat, whole maize, and whole rice were found to be approximately equal to each other,[12] and a similar result was obtained with pigs.[13]

This work, however, was done before much knowledge was available regarding the distribution of the various vitamins, or of the animal's requirements of them, and the foodstuffs tested served often as source of the B-vitamins as well as of protein, so that a deficiency of the constituents of the B-vitamin complex may have influenced the results.

(2) The second method involves a study of the daily nitrogenous exchange with determinations of the minimum daily intake of the protein in question necessary to maintain nitrogenous equilibrium. For calculation of the biological value it is necessary to determine (A) the daily loss of nitrogen of endogenous origin (by measurement of the nitrogen excreted daily by the experimental subject in urine and fæces, when the diet is nitrogen-free and consists only of carbohydrate, fats, and salts); and (B) the amount of nitrogen intake required to replace exactly this daily loss, when the protein investigated is the sole source of nitrogen in the diet. The biological value, then, is proportional to the expression $\frac{A}{B} \times 100$.

These experiments present great technical difficulties, especially in the determination of (A), for nitrogen-free diets are extremely unappetising, and it is often difficult to secure adequate calorie intake over the period of time required to ensure a trustworthy determination. Nevertheless, the observations of Thomas [14] and of Martin and Robison,[15] on themselves, agree in estimating the daily loss of nitrogen of endogenous origin due to the wear and tear of body tissues and formation of internal secretions at about 3·1 g. N, or 0·04 g. N per kg. body-weight. For the pig the amount is 0·05–0·07 g., and for the adult rat (weighing 300–400 g.) about 0·08 g. N, per kg.

In the determination of (B) several hit and miss trials may be necessary, and it is desirable to use the results of experiments in which the nitrogen intake is near, but just below, that required for equilibrium. Thomas devised formulæ by which the biological value could be calculated from any one experiment, whether a negative or positive nitrogen balance was obtained; the criticism of his reasoning and a complete discussion of this point is given by Martin and Robison. Work of this type has been carried out on the human subject,[14 15] the pig,[16 17] and the rat.[18 19 20 21]

The results obtained by Thomas in a series of heroic experiments on himself with 15 different foodstuffs have formed the scientific basis for the theory connecting pellagra with diets containing proteins of too low a biological value for satisfactory nutrition. A study of the series of numbers in the second column of Table II. shows the high value given to the proteins of the pellagra-preventive foods, meat (105), and milk (100), and the lower value for vegetable proteins, with those of maize (29) at the bottom of the list. These figures were used by Wilson [22] in his important study of the protein content of diets associated with outbreaks of pellagra. As a result he was able to marshal an impressive amount of evidence leading to the conclusion that "pellagra is the ultimate result of a deficient supply of protein," the deficiency being judged on the biological value of the protein assimilated.

WHEAT *versus* MAIZE

It is obvious that, on the basis of Thomas's values, any diet largely consisting of maize is defective as regards the protein supply, but his results have not been confirmed by later workers. His technique has been criticised by Martin and Robison [15] in that the separate experiments were of too short a duration, and the intervals between them not sufficiently long to allow of a wash-out of residual nitrogen from the previous diet. The applicability of the formulæ used by him for calculation of the biological value has also been questioned, and to-day the general opinion is that Thomas's figures for the proteins of animal origin are too high and those for the cereal proteins, especially for those of maize, too low. It is unfortunate that Thomas's experiments are the only ones of this type with maize proteins on the human subject. It was the intention of Martin and Robison to extend their work to a study of maize proteins. Their experiments avoided all the errors of technique which have been criticised in those of Thomas, but the rigours involved proved to be so great that their work could not be continued for reasons of health.

While the figures obtained by other workers (given in later columns of Table II.) using experimental animals confirm Thomas's results in the general result that the proteins of animal origin (especially those of milk) are found to possess a nutritive value superior to those of vegetable origin. the differences found are not so great. It is also striking that the values obtained for maize proteins have not been found inferior to those of wheat or other cereals. The most recent research, that of Boas Fixsen and Jackson,[21] carried out at the Lister Institute, was especially devoted to a comparison of the nutritive value of wheat and maize proteins. A special feature of this work was the ample provision of the B-vitamins secured by administering

potent purified preparations containing only small amounts of nitrogen. When this precaution was taken, no significant difference was found between the samples of maize and wheat tested in their capacity to maintain nitrogenous equilibrium in the experimental animal.

The sum of the work described above leads to the conclusion that a theory of the causation of pellagra based on a defective protein supply in diet will not explain the connexion between the incidence of the disease and the consumption of diets consisting largely of maize. It is questionable, however, to in the laboratories of the U.S. Public Health Service at Washington. There was, however, one important observation which was not in agreement—namely, that made by Voegtlin and others in 1920,[24] that pellagra could be cured, or influenced favourably, by addition to the diet of protein-free extracts made from the liver or the thymus gland. Other aberrant facts were those discovered by Goldberger and Tanner in 1925,[25] who showed that the protein caseinogen, even when given in large amounts (46–90 g. daily), did not act as a satisfactory cure, often causing only temporary improvement, while

TABLE II

Relative Biological Value of Proteins

Criterion.	Maintenance of nitrogenous equilibrium.							
Experimental animal.	Man.	Man.	Pig.		Rat.		Rat.	
Foodstuff.	—	—	Protein in diet.				—	% protein in diet.
			Low.	High.	5%	8–10%		
Caseinogen	70	..	..	67†	73	..	76	6
„ purified and heated	..	..	..	..	..	..	45–50	All levels.
Zein	..	..	85*	55‡	..	..	..	..
Gelatin	..	..	52*	..	..	..	..	..
Fish muscle	95	..	..	..	..	..	..	..
Ox „	105	..	..	..	..	69	..	..
Milk (cow's)	100	51§	..	74‡	93	85	86	7
Egg	..	..	..	..	..	93	..	..
Rice	88	..	..	..	86	67	..	..
Potato	79	..	..	..	68	67	..	..
Wheat (whole grain)	..	35§	..	45†	..	67	68	6
„ (embryo)	..	..	..	..	..	..	69	7
„ (endosperm, white flour)	40	..	..	..	..	52	61	7
Oats	..	..	..	47†	79	65	..	..
Maize (whole)	29	..	..	51†	72	60	84	5
	..	..	..	..	..	..	67	8
„ (endosperm)	..	..	..	..	..	..	70	7
Observer	Thomas (1909).	Martin and Robison (1922).	McCollum¶ (1911, 1914).		Mitchell (1924); Mitchell and Carman (1924, 1926).		Boas Fixsen (1930); Boas Fixsen and Jackson (1932).	

* Nitrogen intake equal to endogenous nitrogen—i.e., that excreted in the urine on a N-free diet.
† Nitrogen intake equal to 3 times the endogenous nitrogen.
‡ Nitrogen intake equal to 9–11 times the endogenous nitrogen.
¶ Re-calculated by Thomas's formula.
§ Consistently low values were obtained in this research. The subjects led an active life which included all the work of the investigation. Unfortunately there are no other experiments on the human subject with which these can suitably be compared.

what extent it is justifiable to apply the results of short term experiments on nitrogenous equilibrium, such as the above, to the case of populations subsisting largely on maize for long periods. The experience of mankind is certainly in favour of wheat rather than maize as a staple, and the latter is usually eaten from necessity rather than choice. The experimental work in which young animals have been reared on diets containing proteins derived from one cereal only, has often given results in favour of wheat rather than maize. These experiments have, however, been criticised on technical grounds in the general review of the subject given by Mitchell,[23] who has also pointed out that pellagra is a disease mainly affecting adults and, in this respect, differs from many other diseases of nutritional origin to which young children are especially susceptible.

Theory of Vitamin Deficiency

Ten years ago it would have been true to say that the current opinion, among those who had devoted most time and energy to the study of the subject, was that pellagra was the result of a defective provision of protein in the diet. Among those holding this view were Goldberger and his associates working excellent cures were obtained with 30–50 g. (dry weight) daily of a yeast extract which could only have contained traces of protein.

The results of experimental work with rats enabled Goldberger and his colleagues [26 27] to identify the pellagra-preventive substance in yeast with a constituent of the water-soluble B-vitamin complex, and provided the proof of the fact, long suspected, that the water-soluble B-vitamin contained at least two constituents, both of which were found necessary for the continued growth and development of the rat: (1) the more heat-labile, antineuritic vitamin B_1 necessary to prevent beri-beri in man and polyneuritis in birds and mammals; (2) a more heat-stable constituent, in absence of which young rats developed a pathological condition marked by a symmetrical dermatitis, which was considered to be the analogue of human pellagra.[27] The latter dietetic factor Goldberger called the P-P, or pellagra-preventive, vitamin; it is now generally known as vitamin B_2 in Europe, or vitamin G in the United States.

The quantitative distribution in foodstuffs of the anti-dermatitis vitamin B_2 has been carefully studied on young rats at the Lister Institute (see Table III.). The richest

sources of the vitamin were found to be yeast and yeast extracts, liver, eggs, milk, meat, and green vegetables, while fruits, legumes, and cereals were relatively very poor, the endosperm of cereals (white wheat flour, maize grits, polished rice) being the foods most deficient in this

TABLE III

Vitamin B_2 Content of Foodstuffs (calculated on dry weight; dried yeast = 100) (Roscoe 1931)

Yeast (brewers')	100
Liver (ox)	80
Egg white	20–40
Green leaf vegetables (spinach, watercress, cabbage)	
Egg yolk	10–20
Milk, meat	
Carrot, turnips	
Orange, tomato, banana	5–10
Wheat embryo	
Wheat, maize, rice, millet, peas, potatoes	under 5.

factor.[28 29 30 31] Vitamin B_2 has thus a distribution in foodstuffs roughly similar to that of the antineuritic vitamin B_1, but there are many differences both quantitative and qualitative. In general the foods rich in vitamin B_2 are those containing proteins of high biological value, but its presence in abundance in protein-free extracts made from yeast, egg white, and liver is proof of its separate existence apart from the proteins with which it is found associated.

The canine disease known as "black tongue" was observed to have a distribution in the United States similar to that of pellagra, and Goldberger and Wheeler[32] succeeded in inducing the condition in dogs by administering diets modelled on those known to be productive of the human disease. The canine disease was found to be prevented and cured by the foodstuffs which were of clinical value in human pellagra, and in the same order of value. The two disorders were therefore held to be analogous.[33]

A remarkable similarity is shown in the distribution of (*a*) vitamin B_2, as determined by experiments with rats; (*b*) the pellagra-preventive factor, as shown by clinical trials; and (*c*) the black tongue preventive factor, studied on dogs. These facts are set out in Table IV., which is taken from a paper by Aykroyd and Roscoe,[34] and the conclusion is irresistible that these three dietetic factors are identical.

It is, however, when the distribution of vitamin B_2 among the cereals is studied that the analogy between the experimental work and the facts of human pellagra breaks down. Aykroyd,[30] using rats as experimental animals, made a careful study of the vitamin B_2 content of wheat, maize, rice, and millet. The cereal to be tested was incorporated as a high percentage of the basal diet, which contained all known essential elements, including the antineuritic vitamin B_1, and the growth of young rats was observed over a period of several weeks. The results are set out in Table V. While these foodstuffs are

TABLE V

Vitamin B_2 Content of Cereals (Growth Method) (Aykroyd 1930). (Vitamin B_1 given as Peters's Antineuritic Concentrate.)

—	No. of rats.	Average weekly wt. incr.
		g.
SERIES I.		
Positive controls receiving basal diet + Vit. B_2 as autoclaved yeast, 0·4 g. daily	5	12·5
Negative controls, basal diet only	12	3
SERIES II. *Materials tested.*		
Millet, whole, 30 %–50 % in diet	10	5 to 7
Rice, ,, ,, ,, ,, (2 samples)	11	2 to 5·5
,, milled, ,, 65 % ,, ,,	10	4·5
Wheat, whole, 50 % in diet (2 samples)	14	14
,, (endosperm) 65 % in diet	11	5
Maize, whole, 65 % in diet	14	9·5
,, (endosperm) 65 % in diet (3 samples)	16	5·3

low in vitamin B_2, they were found to be by no means devoid of it. Whole wheat was found to have the highest vitamin B_2 content, then whole maize, and lastly unmilled rice and millet; animals receiving 30–50 per cent. of rice in the diet grew very little more (4 g. average weekly increase) than those on the basal diet without cereal supplement (3 g.). The endosperms of wheat (white flour), of maize (maize grits, maize flour, hominy), and of rice (polished rice) were found to be of an equal, but low, value. The very definite superiority in vitamin B_2 content of whole maize over unmilled rice and millet, and the lack of evidence of any inferiority of maize endosperm as compared with

TABLE IV

Comparison of the Effects of Various Foodstuffs on (a) vitamin-B_2 deficiency in rats; (b) pellagra in man; and (c) "black-tongue" in dogs. (Aykroyd and Roscoe 1929.)

Material.	Rat. Vitamin B_2.	Man. P.P. factor.	Dog. Black-tongue preventive factor.
Maize endosperm	Very poor (65 %).	Associated with pellagra in U.S.A. and Italy.	—
Wheat flour	Very poor (65 %).	Associated with pellagra in U.S.A.	Used in basal diet to produce the disease.
Whole maize	Poor (30 %), growth about half the normal.	Traditionally associated with pellagra.	No preventive action; used in basal diet to produce the disease.
Whole wheat	Poor, but better than maize.	—	66 % in diet delayed onset of the disease, no protection.
Peas	30–40 % needed for good growth ("Clipper" peas).	30–35 % (168 g. daily), incomplete protection (Virginian cowpea).	58 % slight protection; 73 % almost complete protection (Virginian cowpea).
Wheat germ	15–30 %, good growth.	30 %, protection almost complete.	31 %, protection almost complete.
Fresh milk	5–10 % milk solids, good growth.	20 % solids (1200 g. buttermilk daily) protected.	250–300 c.cm. skim milk daily protected.
Lean meat	7–10 % (dry wt.), good growth.	10 % (dry wt. 50 g. daily) protected.	11 % (dry wt.) protected.
Dried yeast	1–3 % good growth.	7 % (30 g. daily) protected.	5 % protected.
Liver	1–2 % (dry wt.), good growth (ox liver).	Alcoholic extract of ox liver effective in treatment.	11 % dried pork liver protected.
Dried egg yolk	7–15 % good growth.	—	17 % protected.

Percentages refer to the proportion of the foodstuff contained in the diet.

that of wheat or rice, are facts which fail to explain the connexion of pellagra with the consumption of maize, whether in the unmilled or milled form. If pellagra were indeed caused by a simple deficiency of vitamin B_2 it should occur chiefly where populations subsist on poor diets containing rice, rather than maize, as a staple, and it should be no more frequent among those nourished chiefly on maize products than among the poorer classes in countries where wheat is the cereal used. This, however, is not the case. Among rice-eating people, beri-beri, and not pellagra, is the menace to those whose diet is lacking in supplementary foods, and this is also true where the food consists too exclusively of white wheaten bread and flour, as, for example, was found by Aykroyd in Labrador and Newfoundland.[31]

Theory of a Maize Toxin

While both the theory of amino-acid deficiency and that of vitamin deficiency give a satisfactory explanation of many of the facts connected with the ætiology of pellagra and with its prevention and cure, both fail to account for one very characteristic feature—the usual association of the disease with the consumption of maize. There remains, however, a hypothesis which has received many adherents in the past—viz., that maize contains a definite poisonous substance and that pellagra is caused by its toxic action. The literature on pellagra published in the second half of the nineteenth century is almost entirely concerned with this theory and the evidence, clinical and experimental, in its favour. Most of this emanated from Italy, where pellagra at that time was recognised as a serious menace, and was the subject of intensive study.

According to some of these authorities (e.g., Lombroso, 1869–1897) the toxin is produced by moulds and other micro-organisms, with which maize may be infected. According to others (e.g., Neusser, 1887), a toxic substance is produced in the organism as the result of the digestion and absorption of maize products. The experimental work brought forward in support of these theories is, however, confusing and difficult to interpret; a good account is given by Harris,[35] to whose book reference should be made.

The occurrence of the skin lesions on exposed parts of the body in pellagra led to the idea that maize might contain a photo-sensitising substance analogous to that contained in buckwheat, and this suggestion received experimental support in the oft-quoted experiments of Horbacewski.[36]

In his observations white mice fed on a diet of maize, polenta, and milk developed a dermatitis if exposed to light, whereas wild grey mice remained in good health. When extracts made from maize with alcohol or water were administered to white mice or white rats fed on a diet of wheat flour and milk, they became sensitive to light, and developed a dermatitis with muscular spasms leading to death if maintained in the light, but recovery took place if the animals were placed in the dark. Horbacewski's experiments do not, however, read very convincingly; they contain contradictions, there is lack of uniformity in the results of the different experiments, and they have not been confirmed. Attempts to repeat them were made by Aykroyd [30] at the Lister Institute, and the results were entirely negative. Both albino and black and white rats throve well on the maize diets described by Horbacewski, and a daily short exposure to the rays of a mercury-vapour lamp did them no harm. Alcoholic extracts made from maize were also administered but no toxic effects could be detected. Repeated unsuccessful attempts have been made by various workers at the Lister Institute to detect any extra sensitivity to visible or ultra-violet light in rats receiving diets composed largely of maize products, the only exception being some not altogether satisfactory observations on monkeys which developed a skin erythema on the face, reminiscent of pellagra.[37]

The toxic substance separated from maize and other cereals by Stockman and Johnston [37A] caused paralysis in monkeys and other animals, but no mention is made of dermatitis and other skin lesions.

In more recent years Jobling and Arnold [38] have produced experimental evidence that toxic substances are produced in the intestine as a result of a maize diet. Fungi (supposed by these authors to be derived from the maize ingested), producing fluorescent substances in culture, were isolated from the fæces of 5 out of 9 acute, and of 2 out of 23 chronic, cases of pellagra, and in no instance from the fæces of 50 non-pellagrous persons examined. Extracts of the fluorescent material when injected into mice were found to render these animals sensitive to light; they developed swelling and œdema of the eyelids, reddening of the ears, and death occurred in some cases. This very suggestive work has received no published confirmation in the intervening years; the authors state that the disappearance of the disease in their locality prevented continuance and completion of the work.

A recent series of observations by Sabry [39] on treatment of pellagra in Egypt by injections of sodium thiosulphate are interpreted by the author as showing a specific action of this drug in neutralising a toxin derived from maize circulating in the blood. This toxin is identified with dioxyphenylalanine (dopa) a substance nearly allied to tyrosin, and is held to be responsible for the characteristic skin erythema and the hyper-pigmentation on the exposed parts.

In view of these suggestive, if contradictory, results, it seems likely that the search for a toxic substance in maize and maize products is deserving of more attention in the future. There has been, and still is, a persistent conviction in many quarters among those in direct contact with the disease that deteriorated maize is particularly liable to cause pellagra, an idea reminiscent of the analogous theory, often advanced, that beri-beri is frequently connected with the consumption of damaged rice. Experiments at the Lister Institute have given indications that maize diets which have been kept rather too long before feeding may be unwholesome, in comparison with similar diets containing wheat products. The results are not, however, consistent, and further experimental work on this point is needed and might yield valuable results.

A Theory Covering the Known Facts

An attractive hypothesis that seems worth exploring would be that pellagra is caused by some toxic substance derived from maize which is rendered innocuous by the action of the P-P (pellagra-preventive) vitamin or vitamin B_2, if present in sufficient quantity in the diet. Such a theory would explain the observed curative and preventive action of the foods—yeast, liver, milk, and meat—all of which are rich in this vitamin. The fact that maize is no poorer in vitamin B_2 than other cereals would then be no stumbling-block, since pellagra would naturally tend to develop on one-sided diets consisting largely of maize. For such diets would require an extra provision of vitamin B_2 to counteract their toxic properties and to ensure correct nutrition, and if the foods required to supply the necessary amount of vitamin B_2 were not forthcoming in the other constituents of the diet, the occurrence of pellagra would be expected.

The conception of a dietetic disease being due to a positive toxic agent combined with a vitamin deficiency is not a new one. There are many analogies: indeed, one of these dates from the discovery of the first vitamin.

1. Eijkman,[40] while recognising the action of the substance contained in rice polishings in preventing and curing polyneuritis in birds, envisaged this function as that of an antidote to a poison developed in the animal's system, as a result of the polished rice diet.

2. E. Mellanby [41] has shown that cereals contain a substance called by him "toxamin," which has an antagonistic influence on bone calcification, and he has demonstrated that this action can be neutralised by a sufficiency of the antirachitic vitamin D in the diet. The beneficial effect of a cereal-free diet in checking the spread of dental caries among children has been demonstrated by M. Mellanby and Pattison.[42]

3. In experiments with dogs, E. Mellanby [43] found that the toxic effect of ergot could be checked by addition to the diet of substances rich in vitamin A, such as butter or mammalian liver oils. The fact that ergotism appears in epidemic form in times of drought and famine, it is suggested, may be due to the concomitant deficiency of the usual sources of vitamin A—namely, green vegetables and dairy products. Mellanby also considered the possibility that lathyrism, a somewhat similar disease occurring in India among poor persons subsisting largely on peas, may have a similar ætiology.

4. Boas Fixsen [44] has described a characteristic pathological condition marked by skin lesions and loss of fur in young growing rats maintained on diets in which dried egg white is the sole source of protein. The condition could be prevented or cured by inclusion in the diet of small amounts of a series of foodstuffs, including whole yeast and liver. Most of these contained "good" proteins, and many were rich in B-vitamins. It has been shown by Parsons [45 47] that the incidence or prevention respectively of the symptoms is determined by the proportion of egg white in the diet relative to the proportion of protective substance, such as yeast or liver.

A theory of pellagra formulated as follows would show a close analogy with the facts given under No. 4, thus: *Pellagra is caused by a toxic substance derived from the maize diet, which can be corrected by sufficient "good" protein, or perhaps by sufficient vitamin B_2 (which is found to accompany the "good" proteins).*

The symptoms of vitamin-B_2 deficiency as studied in the rat—the irregularity of the occurrence of the dermatitis and the frequent absence of severe intestinal symptoms—throw some doubt on any supposition of identity between this condition and human pellagra. It is possible that the effective antidote to the maize toxin is neither the "good" protein, nor the vitamin B_2, but in reality some unknown water-soluble substance which is found with these in nature or derived from them in the animal's economy.

The occurrence of pellagra in the United States among severe alcoholic addicts, which is reported to be increasingly prevalent and to have been relatively infrequent before the period of prohibition, is possibly connected with the fact that the illicit liquor may largely consist of "corn whisky" distilled from maize products. The habit of the alcoholic addict to take little other food during periods of excessive indulgence would explain the failure to neutralise poisons derived from the maize liquor. Alcoholic pellagra has rarely been reported in those parts of Europe, where whisky is distilled from barley, and where none of the usual strong liquors are derived from maize. In Rumania, however, where pellagra is a prevalent disease at the present time, maize frequently the staple cereal and "whisky" often distilled from maize, the idea of an association between pellagra and the excessive consumption of alcohol is widespread among both the medical profession and the laity.[47]

The suggestion put forward above that pellagra may be caused by a toxin derived from the diet, which can be corrected in the presence of certain foodstuffs (such as meat, milk, eggs, green vegetables) if given in sufficient quantity, is, at present, a speculation. It might, nevertheless, serve as a useful working hypothesis to those studying the ætiology of pellagra whether by the experimental or clinical method. It is put forward in the hope that by its use research may be stimulated in certain directions, which may result in further progress toward the solution of the mystery which at present shrouds the cause of the disease.

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NEW WOMEN'S HOSPITAL AT HULL.—Lord Deramore, Lord-Lieut. of the East Riding and chairman of the East Riding county council, recently opened a new hospital for women at Hull which has been built and equipped at a cost of £17,000. Provision has been made for a few paying patients.

THE ADRENOTROPIC HORMONE OF THE ANTERIOR PITUITARY LOBE

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Evelyn M. Anderson, M.D.
AND
D. L. Thomson, Ph.D.

It was stated in a previous communication,[1] in which the fractionation of active principles in anterior pituitary lobe extract was considered, that the thyrotropic and adrenotropic substances tended to run together, but that certain evidence suggested that two separate active principles were concerned in the production of the thyrotropic and adrenotropic effects in hypophysectomised animals treated with purified anterior lobe extracts. We are able now to present conclusive proof that the adrenotropic principle as obtained in refined extracts is quite distinct from the thyrotropic principle.

The hypophysectomised rat has proved to be a very satisfactory test animal for detecting the presence of the adrenotropic hormone. We have included in this series 125 rats which proved to be completely hypophysectomised according to the following criteria: (1) weight loss following hypophysectomy; (2) complete failure to grow; (3) atrophy of the left adrenal removed for control examination before starting the injections; and (4) absence of any fragments of pituitary by careful inspection at the time of autopsy. In some of the animals we have had further evidence of the completeness of the hypophysectomy by determining the basal metabolic rates and by serial sections of the sella turcica.

The animals used were hypophysectomised 11 to 148 days previously. Before starting the injections the left adrenal was removed, weighed, and sectioned for histological examination. Removal of one adrenal from the hypophysectomised rat is not followed by a compensatory hypertrophy of the other adrenal such as occurs in the normal animal. In six control animals from which the left adrenal was removed 8 to 23 days after hypophysectomy and the right adrenal removed one week later, the right adrenal in each case weighed either the same as or less than the left adrenal of the same animal; all showed marked atrophy of the cortex by histological examination. In another group of seven hypophysectomised animals receiving Witte's peptone (20 mg. daily) or extracts of anterior pituitary free from the adrenotropic hormone, there was no evidence of any repair of the atrophy which is seen in the untreated hypophysectomised rat.

Out of 40 different extracts of the anterior pituitary lobe which have been tested, 34 were found to contain the adrenotropic hormone. Eight of these extracts show a fairly high degree of potency, causing an increase of 50–300 per cent. in the weight of the right adrenal over that of the left adrenal which had been removed previously as a control. Furthermore, two of the extracts which have been assayed bring about

FIG. 1.—Photomicrograph of left adrenal (wt. = 4·5 mg.) from an untreated rat 13 days after hypophysectomy. There is atrophy of the cortex.

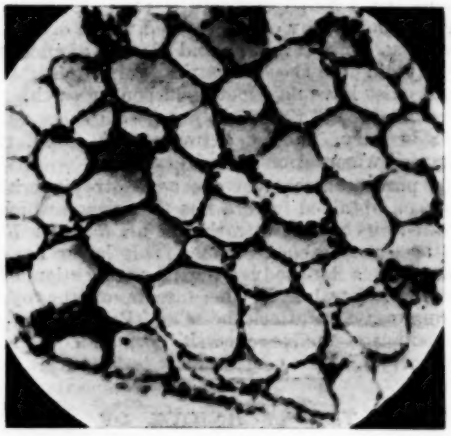

FIG. 3.—Photomicrograph of the thyroid (wt. = 11·0 mg.) from the same rat shown in Figs. 1 and 2 after six days of adrenotropic hormone. The histological picture is that of an untreated hypophysectomised rat.

FIG. 2.—Photomicrograph of the right adrenal (wt. = 8·5 mg.) from the same rat shown in Fig. 1, after six days of adrenotropic hormone (19 days after hypophysectomy). The cortex appears normal.

[1] Collip, J. B.: The Lancet, 1933, i., 1208.

repair of the adrenal in the hypophysectomised rat when 0·025 c.cm. (⅛ mg. total solids) is administered twice a day for one week.

Four of the extracts having a high degree of potency show no trace of the thyrotropic hormone by the following tests: (1) failure to raise the low metabolic rate of the hypophysectomised rat; (2) failure to prevent the atrophy of the thyroid which occurs after hypophysectomy (Fig. 3); and (3) lack of effect upon the thyroid of the immature guinea-pig. These extracts also have no effect upon body growth.

Extracts boiled for 30 minutes still show adrenotropic activity. Active extracts were found to be ineffective when administered orally.

Our purest extracts of the adrenotropic principle have been obtained from a fine flocculence which has separated out on concentrating at pH 5 to 6 a 75 per cent. acetone-soluble fraction. This latter has been obtained as a by-product in the purification of the thyrotropic fraction in the filtrate of the original aqueous extract after the $Ca_3(PO_4)_2$ adsorption treatment to remove growth hormone, as in the "Q" process.[2]

THE TECHNIQUE OF SUPRAPUBIC PROSTATECTOMY

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During the past year I have had the opportunity of seeing many masters of the suprapubic operation for removal of the prostate gland. The results of this observation may be of value to those who are interested in the subject. It will make for simplicity to describe the operation as I now perform it. The technique is essentially that used at St. Peter's Hospital, London, with modifications suggested mainly by Prof. A. von Lichtenberg's practice in Berlin.

In the early days of the operation the incision was a small one and the whole procedure was carried out by sense of touch only. The results were surprisingly good in the hands of Sir Peter Freyer; but in those of most surgeons blind prostatectomy had an unenviable mortality. In more recent times many factors have contributed to the reduction of this mortality. The most important of these, in the order of their importance, are:—

1. Recognition of impaired renal function and its careful pre-operative treatment.
2. Adequate control of hæmorrhage.
3. Improvement in methods of anæsthesia.
4. Thorough post-operative supervision.

At the present time it is probably fair to state that when the operation is performed by genito-urinary specialists, the mortality of prostatectomy is in the neighbourhood of 10 per cent.

ANÆSTHESIA

In this paper we are concerned with the operation only. The pre-operative preparation will not be discussed and the patient is presumed to be in a condition suitable for prostatectomy. First of all, the anæsthetic must be considered, and it is here, I feel, that the greatest advance has been made in recent times. Formerly it was the custom to employ spinal analgesia supplemented with gas-and-oxygen; this was a great improvement on general anæsthesia with ether. Now avertin narcosis with peripheral nerve block appears to be a further step towards the ideal.

The technique is as follows.

The rectum is emptied by an enema of sodium bicarbonate, 3i to the pint; 100 mg. per kg. body-weight of freshly prepared, tested, warm avertin solution is run into the rectum while the patient is in bed. Sound sleep ensues in a few minutes. The patient is now taken to the operating room and placed on his left side on the table. An epidural injection of 30 c.cm. of a 3 per cent. solution of novocain is made through the hiatus sacralis into the sacral canal. The patient is turned on to his back. A soft rubber catheter is passed and the bladder distended with boric solution. The catheter is clamped and left in situ. Infiltration of a suprapubic area with 1 per cent. novocain is now carried out. The area is diamond-shaped and extends from the umbilicus to the pubes and for three inches on either side of the midline. The infiltration involves the skin in the line of the incision from unbilicus to pubes. Novocain is also injected through the rectus sheath into the deeper parts of both rectus muscles. The needle is then passed into the space of Retzius in the midline so that the perivesical tissues are infiltrated; this last injection need be made in the lower half only of the diamond area. If the skin has been infiltrated in the line of the incision first, the anæsthetic will have taken effect here by the time the injection elsewhere is completed.

THE OPERATION

The surgeon stands by the left side of the patient who is lying flat on his back. Skin and superficial fascia are divided in the midline from pubes to umbilicus until the linea alba shows in its whole subumbilical length. The fat is carefully divided through its fine attachments to the front of the recti sheaths and dissected laterally so as to expose a lozenge-shaped area of the aponeuroses. Next a transverse incision, three-quarters of an inch long, is made across the lower part of the exposed linea alba. This incision opens both rectus sheaths and the precise position of the linea alba is defined. The value of this manœuvre will be appreciated by those who have just missed the midline and have had to damage the medial edge of one or other rectus muscle in making the vertical incision over the bladder. It is now easy to divide the linea alba accurately in the mid-sagittal plane from pubes to umbilicus. The division may be made boldly in its lower half, but carefully in the upper, because here the peritoneum is immediately subjacent.

Having divided the fibrous tissues, the extraperitoneal and extravesical fat is exposed. With the gloved finger this fat is gently separated from the bladder. A large damp swab is then used gently to press this fat and any little contained apron of peritoneum upwards for 3 or 4 inches above the pubes. The extravesical veins now show up well and the tense bladder is felt below them. The scalpel, with its cutting edge turned towards the symphysis pubis, is plunged boldly into the bladder in the midline. The left index and second fingers are inserted into the wound thus made while the assistant uses the sucker to remove any boric solution which may escape. The nearer edge of the bladder is picked up with a large round bodied needle carrying 10 inches of catgut. This suture is clamped by its ends and used as a sling. A similar sling holds up the right margin of the bladder wound. The sucker empties the bladder while the incision in its wall is extended upwards until the wet swab covering the extraperitoneal fat is reached. At this point a third sling is passed through the bladder at the apex of its ventral opening.

The surgeon's right hand is now passed into the

[2] Collip, J. B., Selye, H., and Thomson, D. L.: Proc. Soc. Exp. Biol. Med., 1933, xxx., 544.

bladder for the first time. The first and second fingers feel for the enlarged prostate with the catheter projecting from its summit. The ulnar border of the hand sinks between the recti muscles and rests upon the wet swab covering and protecting the extraperitoneal fat. Enucleation is begun, preferably behind the so-called median lobe. Here the gloved fingers endeavour to insinuate themselves through the vesical mucous membrane into the groove between the gland and the internal sphincter muscle. In the case of large prostates this is usually easy. Enucleation is carried out by sweeping the fingers round to the right then to the left and across the front in the plane between gland and muscle. Finally the urethra is torn across at the apex of the prostate, the gland is unthreaded from the catheter traversing it and removed.

Often it will be found that it is difficult to insinuate the fingers through the bladder mucosa behind the middle lobe. This difficulty is the more frequently encountered since the sacral analgesia produces such relaxation of the supporting muscles that the prostate is not held up against the pressure from above. Moreover there is no left forefinger in the rectum nor hand against the perineum to steady the lax pelvic floor. Therefore in any but large prostates enucleation must often be started in one of two ways.

First the forefinger may be passed into the internal meatus alongside the catheter and the prostate burst from within outwards. Usually the tear will occur forwards and the fingers will recognise the splitting of the gland from its fascial surroundings by the smooth and firm surface of the capsule. Tearing laterally through the substance of the prostate can only do harm and removal must not be continued unless the separation is made in the right plane. In the event of failure of this method to allow enucleation to proceed smoothly, the operator must expose the prostate so that he can see what he is doing. Exposure is accomplished by lifting up the bladder wound margins by means of the three slings. This opens a triangular wound with its apex towards the umbilicus and its base towards the symphysis. Into the wound are inserted the vesical blades of a Thomson-Walker bladder retractor and the instrument opened. The upper blade is then applied on top of the swab protecting the extraperitoneal fat. This blade is drawn cranially and the interior of the bladder is widely exposed. The assistant's right hand holds the lower end of the bladder wound back behind the symphysis with the retractor for that purpose. The prostate is now easily seen.

The surgeon may either make an incision with the scalpel from the internal meatus posteriorly and laterally through the gland, or he may use blunt-pointed scissors to divide the mucous membrane covering the back of the middle lobe until the glistening prostatic capsule is well seen. The retractor is then removed and the fingers reinserted. The incision made is felt and entered, and the fingers are now able to work their way round the gland and effect its removal.

DISSECTION OF THE GLAND

Failure to enucleate with the gloved finger demands that the gland be removed by dissection. This is usually necessary only in the small fibrous glands and is best done with long-handled scissors with blunt-pointed blades curved on the flat.

The prostatic cavity is filled with a warm moist gauze pack, and any blood or blood clot is removed from the bladder. The Thomson-Walker retractor is inserted as described above, and the patient placed in the Trendelenburg position. On the removal of the gauze pack bleeding vessels may be seen, which are secured by long-pressure forceps. The prostatic cavity is clearly visible and may be examined minutely if a good headlamp is worn. Next a long-pressure forceps is used to take a firm hold of the shelf of mucous membrane overhanging the posterior part of the prostatic cavity. A wedge (base forwards) is removed by cutting this forceps free with a good width and depth of this shelf. This manœuvre guards against post-prostatectomy obstruction, due to the formation of a diaphragm between bladder and prostatic cavity.

Any bleeding vessels in the torn edge of the bladder mucous membrane may be surrounded and tied off with a catgut stitch. Those deep in the cavity may be ligated with difficulty; they often stop bleeding on pressure; it is simplest and easiest to coagulate them with a diathermy electrode touched against the forceps controlling them.

Hæmorrhage ought now to be completely arrested. If there is any doubt about this it is much better to pack the cavity with gauze soaked in flavine and paraffin emulsion than to risk post-operative bleeding. In any case the catheter is now withdrawn by an orderly until its eye rests in the middle of the prostatic cavity. The catheter is fixed to the penis at this level. Any diverticula or calculi are removed, the patient is placed in the horizontal position and closure of the wound is started.

A red rubber drainage-tube, one inch internal diameter, is taken and a slice half an inch wide cut out of one side in the whole length of the tube. The tube is adjusted so that when projecting half an inch above the skin its deep end reaches to a level in the bladder one inch above the trigone. This drain is held by the assistant in the lower end of the bladder wound while the operator removes the retractor and changes the blades. With its cross-bar towards the patient's feet the retractor is reinserted to hold back skin and superficial fascia and muscles. The bladder wound is held up by its three slings and closed down to the drainage-tube with a continuous suture of fine 00 chromic catgut. The protecting swab is removed from the extraperitoneal fat, and care is taken that no tear of the delicate peritoneum has occurred.

The retractor is now adjusted to release the muscles and hold back skin and fat only. Two mattress sutures of No. 2 chromic catgut are inserted through the whole thickness of the recti muscles and their sheaths. The ends of these sutures are clamped and left long, while a continuous stitch of No. 1 chromic catgut unites the cut margins of the linea alba from the umbilicus to the drainage-tube. The mattress sutures are then tied firmly. A continuous suture of dermol closes the skin incision and a single stitch secures the drainage-tube at the lowest end of the wound. Voluminous dressings of gauze are applied, the catheter is clamped at its extreme end, and fastened securely to avoid its being accidentally withdrawn.

AFTER-CARE

It is very important at this stage for the surgeon to superintend the transport of the patient back to his bed. Old men in the Trendelenburg position for half an hour or more may not respond immediately to the change back to the horizontal posture. Therefore it may be necessary to keep the patient's head a little lower than his feet for half an hour or so. Usually this is quite unnecessary and no weakening of the pulse is noted when the patient is placed horizontally. When, however, the pulse fails on levelling, arrangements must be made to take the patient back to bed with his head below the level of his heart and to keep him thus till he can safely be put in the horizontal position.

In bed the patient is kept warm and dry. Morphine is given for restlessness and pain. Six or eight hours after the operation the patient is usually stuporose; he will talk if spoken to; but is amnesic. The dressings will be soaked with blood-stained urine and must be removed. Have the following ready sterilised:—

(1) Hamilton Irving's suprapubic box (celluloid pattern with two drain tubes) complete with tubing; (2) thymol

ointment; (3) an irrigating can containing 1/15,000 silver nitrate solution this irrigator should have a Murphy drip attachment in the middle of five feet of tubing; (4) a glass connector to join the irrigator to the catheter; (5) a gauze bag, two inches diameter, containing boric acid crystals.

Soiled dressings are removed. The skin is dried and smeared thickly, over the whole area to be covered by the box, with thymol ointment. The box is adjusted to fit snugly and the bag of boric crystals placed in it. The irrigator is connected to the catheter and continuous irrigation started. The urethra is protected from an ascending urethritis by surrounding the catheter at the external meatus with a swab soaked in glycerin. By this means the bladder is kept free from sepsis, the urine is prevented from decomposing and irritating the skin. Blood clots are very unlikely to form because there is no stagnation in the prostatic cavity.

It will be remarked that there is no small drainage-tube in the space of Retzius. In my experience this tube is unnecessary because the space has been opened behind the pubes as little as possible and any recess in that vicinity remaining after closing the wound is drained effectively by the tube passing from the bladder. The slot cut in the whole length of this tube leaves the drain accessible to any fluid wanting to escape from its neighbourhood, and as the slot points towards the pubes, the drain may be said to be open to the space of Retzius.

The patient's general condition is improved as quickly as possible by encouraging the intake of much bland fluid. He is encouraged to breathe deeply and to move his limbs. Fruit juices are pushed both for their glucose content and for their laxative effect. The bowels are likely to move naturally on the third day after operation; enemata are avoided as far as possible. If a gauze pack has been left in the prostatic cavity to control oozing, it is best left till the third post-operative day. Under the continuous irrigation system the gauze will not become offensive, and it is likely to separate more easily after three days than at an earlier time. For the removal of this gauze it seems to me best not to use general anæsthesia, such as nitrous oxide. I say this because of the great shock that used to be noted by every house surgeon, who, acting on the instructions of his chief, removed such a pack from prostatic cavity or gall-bladder fossa under gas anæsthesia. The shock appeared to be caused by the violent stimulation of afferent nerves when the sticky gauze was suddenly withdrawn. The gauze was usually removed after 24 hours, a time when it was most firmly adherent, and the withdrawal was sudden because a strong pull was necessary to start it, and it came with a rush. I prefer to saturate the gauze in the prostatic cavity with novocain, 100 c.cm. of 1 per cent., run in through the irrigator. The pack may then be pulled out gently without causing the shock associated with the older method.

The suprapubic drainage-tube is kept in situ as long as there is any blood clot or blood staining to be seen in the urine. As soon as the drainage is quite clear the tube is removed whether this be on the second or fifth day after the operation. The tube is shortened at any time if it is causing pain by touching the trigone of the bladder. After an operation such as this, it will be realised that the bladder forms an elastic tube gently moulding itself around and lightly gripping anything within its grasp. The rubber tube is so gripped and is unnecessary for the conduct of urine to the surface. Its purpose is to ensure a free exit for clots. Therefore remove it when there are no clots to be seen, and the urine is free from blood.

I do not like rubber bags because they appear to me to contravene the principles that ought to guide intravesical surgery. They are unnecessary, and an unnecessary foreign body in a raw area of the bladder retards healing. They deform the urethra and its musculature by straightening out that channel and by insinuating themselves too far into the external sphincter. They are often too small to exert pressure on the torn edge of the vesical mucous membrane where bleeding is most profuse. Sepsis may occur in dead spaces not accurately obliterated by the bag in the prostatic cavity. Healing is retarded and sloughing encouraged by the ischæmia caused by the bag's pressure.

The methods described above are adequate for hæmostasis, especially when the coagulating diathermy current is available. After removal of the drainage-tube the continuous irrigation is kept up for 24 hours, then the intra-urethral catheter is removed. The shorter the time the catheter dwells in the urethra the less danger there is of epididymitis consequent on posterior urethritis. Therefore clean up the bladder as quickly as possible and remove all foreign bodies from it and the urethra.

I have not used continuous suction drainage for the bladder after prostatectomy because healing seems to occur as quickly in a prostatectomy wound as in any similar incision. Urine, when prevented from decomposing, does not appear to delay healing of either bladder or tissues unaccustomed to contact with this fluid. Under the above régime the patient will pass a few drops of urine per urethram about the tenth post-operative day, and the wound will be dry and firmly healed by the fourteenth day. Control of micturition is established in the next few days, and of course the frequency is marked because the bladder is small and inflow into it is, or ought to be, over 100 ounces per 24 hours. The patient may be lifted into a chair three days after his wound has healed. He ought to be able to go home within four weeks of his operation. It is advisable for fat patients to have a well-fitting belt applied before they are allowed out of bed. A pendulous abdomen is too great a strain for the uniting linea alba.

SCOPE OF THE OPERATION

The part removed in this operation consists, I believe, of the whole prostate gland except that portion below and behind the ejaculatory ducts. In other words the part removed consists of the middle "lobe," lateral "lobes," and anterior commissure. The posterior "lobe" is left behind and usually the ejaculatory ducts are intact. It is not easy to see how the part removed in this operation can be an adenoma which has displaced the normal prostatic tissue to form a pseudo-capsule for itself; one difficulty is that the specimen is symmetrically disposed on each side of the midline, and an adenoma is not likely to be invariably so symmetrical. The other difficulty is that the prostatic urethra forms part of the specimen. An adenoma starting at one point in the gland could not surround that tube and fuse with itself to form a symmetrical whole traversed by the urethra. Surely an adenoma, however large, must be on one side of the urethra. I therefore share the view of those who hold that in senile prostatic hypertrophy the part of the gland removed by the suprapubic operation consists of the whole prostate, except that portion below and behind the ejaculatory ducts.

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PSORIASIS AND RHEUMATISM

A COMPARISON

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It is a matter of common observation that psoriasis is often associated with rheumatic infection, both in individuals and in families, but opinions differ as to whether there is any direct relationship between them. No figures are available to show the incidence of rheumatism in the family history of patients with psoriasis, and it was therefore surprising to find, on inquiry into a series of 53 psoriasis cases, that 80 per cent. gave a history of some form of rheumatic infection in a near relative, whilst only 35 per cent. gave a familial history of psoriasis. Further, 70 per cent. of these psoriasis patients proved to be suffering from arthritis or rheumatism. The figures seem to invite a review of the relation between the two conditions.

There is a curious analogy between psoriasis and rheumatism as they occur in children. Both are rare under the age of 5; both are limited to temperate climates, and they have a similar seasonal incidence; both occur in a lag period following tonsillitis or sore-throat and respond to treatment with salicylates; and in both a first attack seems to predispose to further attacks.

As a result of research work in different parts of the world it has been finally established that the causal organism in rheumatic infection is a streptococcus, the exact nature of which is still undetermined. Seasonal and climatic incidence of the disease seems to be explained by the observations of Coburn.[1] He has shown that there is a seasonal rise in New York in the prevalence of *Streptococcus hæmolyticus* in the upper respiratory tract, that these organisms are seldom found in the upper respiratory air-passages in Porto Rico, and that in rheumatic patients taken from New York to Porto Rico the *S. hæmolyticus* tends to disappear and the patients lose their liability to active rheumatic manifestations, both of which recur when they return to New York.

A relationship between tonsillitis and rheumatic manifestations is now generally recognised, but the literature contains few records of an associated history of throat affections with psoriasis. Winfield,[2] however, has reported an interesting series of six cases of psoriasis following tonsillitis, and of the cases I have recently investigated 50 per cent. give a history of tonsillitis or throat trouble, and it seems that this association should not be dismissed as a mere coincidence without further consideration.

THE HISTOLOGY OF THE RHEUMATIC AND PSORIASIS LESIONS

If we examine the histopathological characteristics of the psoriasis lesion and the lesion of acute rheumatic infection the analogy between psoriasis and rheumatism appears to be further strengthened. Lesions which are morphologically similar to the subcutaneous nodules of acute rheumatism can be produced experimentally by injecting streptococci subcutaneously, and much has been learnt from these experiments of the manner in which the lesions due to rheumatic infection develop. No one has so far succeeded in experimentally producing cutaneous lesions similar to those of psoriasis, but the histopathology of psoriasis has been most carefully investigated, and Civatte[3] has given a detailed description of the manner in which the lesions develop.

In the evolution of the experimental rheumatic nodule and the psoriasis lesion there is first an exudative reaction characterised by œdema and congestion of vessels and a migration of leucocytes, chiefly mononuclear in the early stages, but at a later stage polymorphonuclear. Following this there is in both a proliferative reaction which affects the cells in the immediate neighbourhood of the lesion. In psoriasis these cells are the cells of the rete malpighii, and their proliferation leads to the excessive production of scales which is such a distinctive feature of the psoriasis eruption.

In the rheumatic nodules the cells affected in the immediate neighbourhood of the lesion are: (1) cells of the reticulo-endothelial system, "fibrocytes"[4]; (2) connective tissue cells, "fibroblasts," and the result of the proliferative reaction of these cells is the production of the submiliary nodule, the typical lesion of rheumatic infection.

Lastly, in both the psoriasis lesion and the rheumatic nodule, the reaction may pass on to the formation of abscesses which in both instances are sterile. In psoriasis these abscesses, first described by Munro and Sabouraud in 1904, are regarded as a unique and characteristic feature. They result from an increased exudation of polymorphonuclear leucocytes, which become imprisoned in the upper layers of the rete malpighii and which may be so extensive as to disintegrate the cells of the rete to such an extent that abscesses are formed. When this occurs the lesions of pustular psoriasis[5] are clinically demonstrable. The conditions which conduce to the formation of abscesses in psoriasis are not known.

In the rheumatic nodule abscesses are, as in psoriasis, associated with an increased exudation of leucocytes, but certain conditions which lead to their development in rheumatic infection have been demonstrated experimentally by Clawson.[6] He has shown that, by increasing the dose of streptococci, abscesses may be produced in normal or immune animals, but that in sensitised animals abscesses appear after doses which produce either no noticeable effect or only small firm nodules in normal or immune animals.

From this brief review it will be observed that histologically the difference between the two conditions appears to be due to a difference in the tissues in which the reaction is localised—epidermal in psoriasis, subdermal in the rheumatic nodules.

THE PART PLAYED BY ALLERGY

Variation in the type of the reaction, due to the nature of the tissue in which the reaction is localised, is a characteristic of allergic conditions, and Clawson's experimental work has furnished proof that allergy plays a very important part in the production of the rheumatic nodule. No such experimental evidence is forthcoming for psoriasis, but so many of the features which characterise allergic conditions are manifested in psoriasis that the clinical findings point to the conclusion that in psoriasis we are dealing with a state of allergy. One need only mention the familial predisposition, the appearance in apparently healthy persons, the sudden outbreaks, the spontaneous remissions, the diversity of causes which seem to precipitate attacks, and the effect of disturbances of the sympathetic nervous system.

But, as in all allergic conditions, the difficulty in psoriasis is to discover the antigenic factor, and

so far every line of research has failed to achieve this object, and the cause of psoriasis is still unknown. Hypothetical toxins due to defective metabolism or disturbed renal function have been suggested as causes, and special stress has been laid on the gouty diathesis owing to the frequency of the association of psoriasis with various arthropathies. How often has this same theory of a gouty diathesis been invoked to explain the occurrence of rheumatism, and how altered is our conception to-day of the causes underlying rheumatism?

The types of arthritis which are found in association with psoriasis are not represented merely by the various arthropathies which accompany rheumatism. A small number of cases, in which recurrent attacks of psoriasis synchronised with attacks of arthritis complicated by hydrarthrosis, led Garrod and Evans [7] to suggest that psoriasis with arthritis might be regarded as a definite clinical entity. Such a differentiation scarcely appears tenable when we consider the other types of arthritis with which psoriasis is found to be associated. My own records include cases of typical rheumatoid arthritis, one case of osteo-arthritis of the lumbar spine in a man of 58, in whom the eruption appeared for the first time with the onset of arthritis, cases of arthritis following recurrent attacks of rheumatic fever, and many cases with fibrositis and grumbling joint pains. Must there not be some common factor underlying all of these conditions in which the same skin eruption is found?

The common factor in rheumatic affections has been established, and a streptococcal origin accepted, but more recently still Cecil, Nicholls, and Stainsby [8] have isolated a streptococcus from the blood and joints of cases of infective arthritis, and in 1931 they recovered a similar organism in rheumatoid arthritis. It appears therefore that a streptococcal infection is the common factor underlying the conditions with which a skin eruption of psoriasis is associated, and that psoriasis occurs in persons predisposed to rheumatic infection, and that it is influenced by the same environmental conditions as predispose to rheumatism.

Permanent damage to the heart is the most serious risk of rheumatic infection, but personally I have never observed a psoriasis patient with valvular disease due to rheumatic infection. It is a common saying that psoriasis occurs in the healthy, and this statement would acquire a deeper significance if, inter alia, the observation was confirmed that the subjects of rheumatic infection who suffer from psoriasis do not develop rheumatic heart trouble. The protective mechanism of the skin is generally recognised. May it be that we have in psoriasis another example of this mechanism at work, with its beneficent effects?

CLINICAL ASPECTS OF PSORIASIS AND RHEUMATISM

The constitutional symptoms in an acute generalised attack of psoriasis, even when an exfoliative dermatitis has supervened, are never so severe as in acute rheumatic infection. Many patients, however, never suffer from a generalised attack but, like the subjects of rheumatic infection, develop attacks of varying degrees of severity which clear up only to recur at some future date, it may be with a change of season, or associated with some other cause. In both psoriasis and in rheumatism these attacks show extraordinary variability in severity, in extent, in site, and in duration, and the periods of remission are similarly variable. They tax the ingenuity of the medical attendant to discover a remedy.

The old chronic rheumatic who haunts out-patient clinics with the familiar story of exacerbations of joint and muscle pains bears a strong resemblance to the chronic psoriatic with lesions in the neighbourhood of the joints and a varying eruption. Salicylates are of no avail for these patients, and they have recourse to endless methods of local treatment and every form of physical therapy. In many instances it is the same patient who suffers from rheumatism and psoriasis, and one is frequently told that the pain is relieved when the eruption is worse.

Subjective symptoms are notoriously misleading but they cannot be ignored, and the belief of the sufferer from psoriasis douloureux that there is a direct relationship between the pain and the skin eruption might seem to be confirmed by the similarity revealed by a comparative review of the ætiological, pathological, and clinical features of psoriasis and rheumatic infection.

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DINITRO-O-CRESOL AS A STIMULATOR OF METABOLISM

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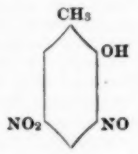
FOR some time past the pharmacological action of the nitrophenols and allied compounds has been under investigation in our laboratories, and the recent paper of Cutting, Mehrtens, and Tainter [1] prompts us to give a preliminary account of our investigations with a compound which we believe to be superior to the one employed by them, which was 2:4-dinitrophenol.

It has been known for many years that certain nitrophenols are capable of causing a marked increase in both the temperature and the oxygen consumption of experimental animals, but hitherto the application of this phenomenon to the stimulation of metabolism in the human subject has not been considered. The American authors referred to above describe a series of cases treated by the oral administration of 2:4-dinitrophenol in daily doses of 3 mg. per kg. body-weight. A continuous diminution of weight has resulted, and they are unable to find any evidence of toxic effects in the doses given. That the compound itself is toxic in large doses there can be no doubt, and it was with the object of producing a body with similar basal metabolic rate-raising properties, but

[1] Cutting, W. C., Mehrtens, H. G., and Tainter, M. L.: Jour. Amer. Med. Assoc., July 15th, 1933, p. 193.

with a lower toxicity, that the investigations about to be described were undertaken.

The method employed consisted of observing the oxygen consumption of guinea-pigs by a modified Krogh technique, and when a steady figure had been obtained for the basal rate the substance to be tested was injected, or alternatively administered by mouth, and the effect on both temperature and oxygen consumption was studied. A great many compounds have been investigated, but up to the present the most promising appears to be dinitro-o-cresol, the formula of which is as shown.



A typical example of the increase in oxygen consumption may be seen in the following experiment. The basal oxygen consumption rate of the guinea-pig, measured in c.cm. per g. guinea-pig per minute, was 0·0135; the temperature was 97° F. Dinitro-o-cresol (8 mg.) dissolved in sesame oil was administered by subcutaneous injection. One hour afterwards the oxygen consumption had risen to 0·0376 c.cm. per minute and the temperature to 100·9° F. Four hours later the temperature had reached 102·8° F. Similar experiments with 2 : 4-dinitrophenol produced a rise of about one-third the magnitude. Observations on the toxicity of these two compounds indicated that they are of the same order. Both compounds are active when administered by mouth.

It would appear from these observations that the dinitro-o-cresol compound is more suitable for clinical experimentation since about one-third of the amount is required to produce the same effect as with the dinitrophenol. The clinical application of these compounds is at present under observation, and it is hoped to report on the extension of this work at a later date.

The pharmacological experiments described were made possible by a grant from Messrs. British Colloids, to whom we express our thanks.

Clinical and Laboratory Notes

SOME MODIFICATIONS OF THE SIGMOIDOSCOPE

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The importance of sigmoidoscopy, both in diagnosis and treatment, is increasingly recognised. L. E. C. Norbury [1] says :—

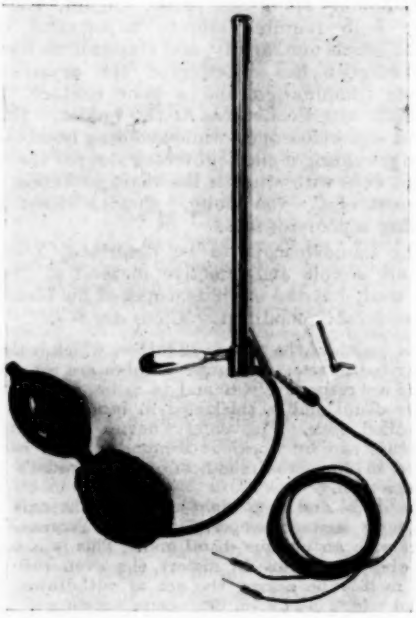
"I would again lay stress on the importance of sigmoidoscopy in middle-aged patients complaining of 'piles' of recent origin, since piles are often a result of a more serious condition higher up the bowel."

E. L. Young, Massachusetts,[2] writes in a similar strain :—

"It should be emphatically stated and reiterated again and again that any change, however slight, in the normal bowel behaviour of any individual without any known cause, particularly in the cancer age, persisting for more than a few days after adequate treatment is started, should demand the most painstaking investigation."

Young further points out that in carcinoma of the colon the first X ray examination is negative in 10 per cent. of cases.

Since sigmoidoscopy is now a routine part of all colonic investigations and is frequently performed in the consulting-room, can it be said that those sigmoidoscopes in common use give uniform satisfaction? The instrument is so simple that it should be possible to eliminate those minor hitches and annoyances which so frequently mar the perfect performance of the examination. By combining the better points of two well-known instruments I think that it is possible to do this.



The sigmoidoscope as modified. The small inset shows the light carrier and lens.

Since Howard Kelly, of Baltimore, in 1895 introduced the use of straight tubes of various lengths, illuminated by reflected light, there have been numerous modifications of the sigmoidoscope. Before this date there had been attempts to examine the lower bowel visually, notably Bodenhamer's long flexible speculum, introduced in 1863. This remarkable instrument was fitted with an involved system of mirrors, but apparently it was too complicated to be practicable. Probably at the present time the two sigmoidoscopes in most popular use are Strauss's tube in this country and Yeomans's in America.

In Yeomans's sigmoidoscope illumination is direct, and is obtained from a powerful electric bulb mounted in a side tube, joining the main tube at an oblique angle near the proximal end. A plano-convex lens refracts the collected rays at a compensating angle to the light carrier and focuses the light at the distal end of the tube.[3] The only part of the illuminating apparatus projecting into the main tube is the lens, so that there is a smooth, unobstructed lumen to facilitate the passage of probes, alligator forceps, &c. One possible criticism of this method of illumination is that some slight reflection of the rays occurs should the interior of the sigmoidoscope be highly burnished. This, however, does not occur to any appreciable extent as the surface of the metal is invariably dulled by sterilisation by boiling.

Lyon and Barth [4] in 1922 described a sigmoidoscope fitted with proximal illumination, but in their

instrument the light-holder lies in the interior of the proximal end of the tube, and must therefore produce some obstruction to the passage of instruments. The distal illumination of the Strauss sigmoidoscope not only impedes the passage of instruments but is always liable to obscuration by fæcal contamination. Time is wasted in passing the distal electric bulb on its holder along the tube. Again, the small electric bulb requires minute adjustment of the rheostat, burns out rapidly, and stands little handling. Every surgeon has experienced the annoyance of flickering illumination and a poor contact, due to the length and slenderness of the holder. Harvey's modified sigmoidoscope,[5] while avoiding fæcal obscuration by providing a glass-protected slot for the holder, does not deal with what is the main objection to the instrument—i.e., the long, slender light-holder, producing a poor contact.

In the sigmoidoscope to be described, Yeomans's admirably simple and effective method of illumination is used, but the other features of his instrument are considerably modified. These are :—

1. The length of the tube is 12 inches, which is the most generally useful size. (Yeomans's tubes are interchangeable, and are respectively 10 and 14 inches in length.)
2. The distal end is thickened in order to provide a broad rolled edge. This safety device was advocated many years ago by Lockhart-Mummery [6] and has been embodied in numerous modifications of Strauss's instrument since then.
3. The distal end is at right-angles to the axis of the tube. Many sigmoidoscopes, including Yeomans's, are designed with an oblique distal end. This is a mistake, as the obliquity tends to distort the even roll of the mucous membrane during the act of withdrawal of the tube, and which is of such diagnostic assistance.
4. A handle is provided. (Yeomans relies on a flange with a milled edge.)

The usual pneumatic rubber hand-bellows is connected with the detachable proximal cap. The whole instrument, with the exception of the light-holder, may be sterilised by boiling.

In the sigmoidoscope described above no new feature is introduced, but the respective advantages of the two older instruments are combined and utilised. Using this sigmoidoscope, and with the patient in the genupectoral position, many of the minor hitches of sigmoidoscopy are eliminated, and such procedures as the removal of a piece of growth for microscopic section are facilitated. The instrument is made by Messrs. Alexander and Fowler of Liverpool.

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INTESTINAL OBSTRUCTION BY GALL-STONES

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THE following case of intestinal obstruction by gall-stones is perhaps worthy of record for two reasons—namely, (1) the site of the obstruction, and (2) the absence of symptoms that might have been expected.

Mrs. A. B. was of normal build and appearance for her age (78). Her health had been good except for occasional attacks of indigestion with flatulence and constipation.

In October, 1930, she had a first attack of biliary colic. There was slight pyrexia lasting for three days, and the gall-bladder was just palpable. There was no jaundice and the attack subsided in eight days. In May, 1931, she had slight pain over the gall-bladder for three days. On Dec. 12th, 1931, she began to have abdominal discomfort with flatulence, and sought medical advice on Dec. 20th. There was a history of pain in the epigastrium, retching, and looseness of the bowels during the preceding 24 hours. She was tender over the gall-bladder, which was just palpable. There was flatulence but no colic. The temperature was 99° F. and the pulse-rate 92 per minute. There was much abdominal distension. Castor oil gave a good result. Her condition improved and with a mild aperient pill the bowels acted daily until Dec. 24th, when she again became distended. Castor oil gave a poor result, but an enema the next morning gave a satisfactory result with much flatus. She became much more distended and

The stones as they were lying in the small intestine (one-quarter natural size).

began to have intestinal colic with visible peristalsis. A diagnosis of intestinal obstruction was made by Dr. S. G. Askey, under whose care the patient had been and to whom I am indebted for the above history.

I saw her first about 10.30 A.M. on Dec. 25th, and she presented a typical picture of small intestinal obstruction. There was no feature to distinguish the case from any ordinary case of mechanical obstruction of the small bowel, nor was it possible to form any definite opinion as to the cause of the obstruction.

The patient's general condition was good and she was removed to a nursing-home, and early the same afternoon the abdomen was opened under general anæsthesia, administered by the open ether method. The cause of the obstruction was soon found to be an impacted gall-stone of large size, which completely blocked the small bowel, the walls of which were stretched round the circumference of the stone. An incision was made immediately over the stone and this, with two smaller ones lying proximal to it, were removed, and the intestine sewn up by a double layer of catgut sutures in the ordinary way. The exact position of the stones was impossible to determine as the condition of the patient demanded as rapid an operation as possible. I satisfied myself, however, that there were several feet of collapsed bowel below the obstruction and several feet of distended bowel above it. The patient stood the operation well but developed signs of pulmonary congestion the following day and died 24 hours later from heart failure due to this cause.

The interesting features in this case are: (1) The position of the obstruction, which was at least several feet above the common site—the ileocæcal valve. (2) The three gall-stones (see Figure) must have at one time completely filled the gall-bladder, and could not possibly have been passed into the bowel via the cystic and common ducts. (3) There was nothing in the history to suggest any acute inflammatory crisis due to any suppurative cholecystitis followed by rupture into the bowel. (4) The change of position of the stones, the two apical ones lying behind the large stone which must have occupied the central position in the gall-bladder.

BRITISH MEDICAL ASSOCIATION

ANNUAL MEETING IN DUBLIN

SECTION OF PUBLIC HEALTH

THE first discussion in this section amounted to a survey of the present state of

The Housing Problem

in Great Britain and Ireland, and a forecast of the probable lines of development in the near future. Dr. M. J. RUSSELL (M.O.H., Dublin), who presided, called at once on Mr. SÉAN T. O'KELLY, vice-president of the Free State Executive Council and Minister of Public Health, as the first speaker, remarking that for 25 years Mr. O'Kelly had been a member of the Dublin Corporation, had concentrated on housing problems, and was now urging the municipalities and local authorities throughout the Free State to speed up progress in this respect. Mr. O'KELLY stated that in the past Dublin and Ireland generally had been very backward as regards housing, but in the last two years a definite advance had been made; he now hoped to see in less than ten years an end of their housing problems and of their slums. It was on the medical officers of health in town and country that they must rely for leadership; great strides had already been made in instructing the community in public health and informing public opinion. The Government would support them fully.

OVERCROWDING IN ENGLAND

Dr. C. KILLICK MILLARD (M.O.H., Leicester) reviewed the present position, and outlined the provisions of the new (1933) Housing Act, which abolished the Greenwood subsidy for "ordinary" municipal houses, and proffered encouragement to the building societies. It was hoped that this abolition would lead to the concentration of municipal efforts on slum clearing. Local authorities and the Government would be authorised to share with building societies the risk entailed in advancing a higher proportion of the building costs of new houses; in practice this might mean that the societies would be willing to advance up to about 90 per cent. of the cost, instead of only about 70 per cent. Since the problem to-day was that of housing the poor, the houses so built must be "intended to let to persons of the working classes." It was improbable, however, that the rents would fall below 13*s*. a week, and thus would usually be beyond the reach of the poor. In the April circular (1331) of the Ministry of Health local authorities were urged to adopt a programme involving the preparation of:—

(1) A list of areas for clearance, with information about the number of houses to be demolished in each, and the number of inhabitants; (2) a list of the areas in which improvement by reconditioning or otherwise was necessary; (3) a time-table of the initiation, progress, and completion of action to secure clearance or improvement of these areas; and (4) a time-table of re-housing coördinated with the displacements contemplated by the time-table of clearance operations.

It was urged that an immediate beginning should be made, and the Minister of Health asked to be supplied with a copy of the programme adopted not later than Sept. 30th. Dr. Millard pointed out that the character of the slum-dweller was of even greater importance than that of the slum-dwelling, and was the factor which presented by far the greater difficulty. Overcrowding, an aspect of the human factor, had also to be dealt with effectually before the slum problem could be solved. It was, he said, a serious defect of the previous Housing Act of 1930 that, while it made provision for the "individual" insanitary house, it made no provision for dealing with "individual" cases of overcrowding, the common cause of which was the large family, much more usual among the poor than among the well-to-do. Large families, poverty, and overcrowding worked in a vicious circle, sometimes one and sometimes another of these being the primary cause.

In the slums, said Dr. Millard, overcrowding was greatly intensified by the shortage of houses to be let at rents within the reach of the poor. Since 1919 nearly two million houses had been built in England and Wales (exclusive of those with a rateable value above £78, or £105 in the metropolitan area), and the population had not increased to any great extent. Yet there was still a demonstrable shortage of houses, and this was attributable to a very substantial increase in the number of families of smaller average size. In Leicester, for example, the actual population had only increased by 5026 during the inter-censal period. Allowing 3·6 persons to a house, this increase would call for 1396 new houses, but the number of dwellings had actually risen in that period by 7764. The average size of the family in Leicester was only 3·6 in 1932, as compared with 4·3 ten years before, but the number of separate families had increased by 7968, or 200 more than the increase in separate dwellings, so that the pressure of families on houses in Leicester was actually greater in 1931 than it was ten years earlier. The present policy of the Government would do nothing to relieve this strain. In any attack on the slum problem the claims of the children should come first; it was usually a waste of time to allow municipal houses to be occupied by families without children. Under the 1930 Act, where houses were provided in connexion with slum clearance, the practice of differential rents had become general; under such a scheme the number of dependent children had necessarily to be taken into consideration when fixing the rent. This had to a large extent removed the handicap on the man with a large family. It would be desirable for the same system to be applicable to existing municipal houses when they fell vacant. Housing departments were, however, afraid of differential renting, thinking that it would entail a great deal of work, and unsettle existing tenants. It was difficult to see why this should be so, especially if the scheme took the form of granting temporary rebates while leaving the standard rent unchanged. Those who ceased to need this assistance should no longer go on occupying a subsidised house, or should pay the full economic rent if they remained in it. Some plan of this kind was essential if the greatest possible use was to be made of the existing municipal houses.

RURAL HOUSING IN IRELAND

Dr. J. A. HARBISON (County M.O.H., Dublin) recalled the fortunate circumstance that attention had been focused on the question of rural housing in Ireland over 40 years ago, and that concrete measures had been taken in the form of the provisions of the Labourers Acts to provide healthy living accommodation in clean surroundings for workers engaged in agriculture, the staple industry of the country. For the past 50 years the purely agricultural labourer had been admitted from the housing point of view to be a distinctly uneconomic entity, for whom private enterprise could not afford to cater; the altered conditions following the war had now

driven the artisan into the same position. The tremendous advantage to public health that had been derived from the provision of thousands of well-designed roomy cottages and allotments of land was well worth the annual charge of approximately £150,000 which fell on the rates in respect of them, for it would be readily admitted that the provision of proper housing accommodation was the most economic way of maintaining the health of the community. In addition to the 42,000 cottages already built, it had been estimated that the housing need of the rural worker in Ireland would not be fully met until another 22,000 cottages and plots had been provided. Some 12,000 of the cottages were required to house persons at present occupying dwellings that had been definitely pronounced unfit for human habitation. The Government in its recent generous housing measure had placed in the hands of local authorities the machinery and money with which to attack the problem. Moreover, to assist the small farmers and others, the State housing programme contained provisions to enable persons affected to reconstruct their existing dwellings or to provide new ones. Grants were available for the reconstruction of dwellings by rural workers and small farmers whose valuations did not exceed £25. Machinery was also provided for securing the repair or demolition of unhealthy houses, the local medical officer being very directly and vitally concerned in this matter. The intention of the statute was to remove as far as possible all housing which was conducive to ill-health. The greatest difficulty of the local medical officer lay in the small rural town, where badly lighted, damp, and otherwise unhealthy houses had in the course of time become huddled together, without effort at planning or thought for the consequences of congestion. There were in the Irish Free State 152 rural towns, each with a population of not less than 500; there were housed in them some 166,000 persons, and there was no urban authority in a single instance. For local administration government purposes they fell within the jurisdiction of the rural sanitary authority. In many of these small towns there existed a condition of squalor and poverty which was as bad as any found in city slums, and a heavy responsibility lay on the shoulders of the local medical officer to stimulate the provision of alternate accommodation. The progress recently made was heartening, but there could be no relaxing of effort until each family possessed a separate dwelling, soundly constructed, and set in clean and healthy surroundings.

HOUSING AND CHILDREN

In Dublin, according to Dr. W. R. F. COLLIS, the crux of the problem was the provision of better accommodation for children. When large blocks of flats were erected there should be arrangements made for the establishment of nursery schools. This would render it possible for good instruction as regards hygiene to begin quite early in life. There were in Dublin probably more children in families than anywhere else in the world, and the whole roof spaces of buildings ought to be utilisable for them. Persons who had specially studied the welfare of children should be invited to coöperate in the matter of housing; medical officers of health should do the planning, assisted by architects and engineers.—The sad lack of accommodation for perambulators in modern residences was regretted by Dr. E. H. T. NASH (M.O.H., Heston and Isleworth), who thought it should surely be possible to keep these sources of dirt out of living rooms. Adequate playing facilities should be made available, and a London case was cited in which attention to this seemed to have had very definite beneficial consequences on the health of adults as well as of children residing in the blocks of dwellings so equipped.—In his reply Dr. KILLICK MILLARD returned to this point, and agreed that it was essential to provide a decent environment for the upbringing of children, even if this involved an uneconomic rent, for otherwise there would be a strong tendency to perpetuate the existing deplorable conditions.

THE ECONOMIC SIDE

Several speakers in the discussion referred to the economic side of the suggested improvements. Mr. H. G. SIMMS (housing architect, Dublin Corporation) maintained that it was impossible to provide the ideal minimum house of five rooms at a rent that the poverty stricken class could pay. The present policy of the Dublin corporation endorsed all that the various speakers had advocated, and in his own city further progress seemed to have been made than was the case across the water. It had been possible to provide a house in the suburbs of Dublin with a living room, two bedrooms, and a scullery at a weekly rental of 7*s*. 6*d*. Four-story blocks of flats were going up in areas previously of the slum type, the weekly charge for each habitable room being about 2*s*. Such figures as these were obviously not economic, but Government grants and the city rates were rendering the scheme practicable. Two qualifications were exacted in the case of tenants: the income must be lower than £2 a week, and not fewer than four members of the family must be under the age of 21. Some reduction in the standard of housing was inevitable, and Dr. MILLARD agreed that this would be admissible provided that health considerations were fully borne in mind.—The PRESIDENT added that the housing problem in Dublin was complicated by the existence of thousands of old houses, formerly occupied by the richer classes but now used as tenement houses, each containing upwards of six to eight families. The Dublin corporation had erected 9500 new dwellings, but it had been calculated that at least 10,000 more were required before it could be claimed that a serious impression had been made on the existing situation. The corporation hoped to provide these dwellings by a building programme of 2000 annually for the next five years. Public feeling had been educated to the extent that no objection was raised by the ratepayers to the financial sacrifices involved, although the annual loss on existing housing schemes was equal to a rate of about 1*s*. in the pound. By the combination of the municipal housing rate and Government assistance two- and three-roomed flat dwellings with a bath and hot water system were being let at a weekly rent of 2*s*. per room, and three- and four-roomed cottages, similarly equipped, at 2*s*. 6*d*. per room. To relieve overcrowding, which was a grave problem in Dublin, the dwellings were allocated mainly on the basis of the number in the family in relation to the extent of its existing accommodation. This helped the poorer classes, which in Dublin and elsewhere had the largest families, and provided prior consideration for the children. Apart from the efforts of some philanthropic societies in Dublin, the corporation was the only body catering for the housing of the less well-off working classes. Dr. Russell thought that Dublin's solution of the city's special problem was the only practicable one—namely, to waive the principle of a general economic rent, and boldly let the dwellings at low rents which were within the means of the tenants.

SECTION OF ORTHOPÆDICS

AT a meeting of this section, with Sir WILLIAM WHEELER, the president, in the chair, a discussion on the

Treatment of Chronic Osteomyelitis

was opened by Mr. H. WINNETT ORR (Nebraska). He had taken as his text, he said, the "prevention of accidents and complications in the course of the treatment in chronic osteomyelitis," whether arising spontaneously or as a sequel to a compound fracture. Just as in ordinary surgical practice, the various types of acute sepsis—such as erysipelas, gangrene, and acute septicæmia—had come to be looked on as avoidable accidents, so he believed that we should regard secondary sepsis, septic arthritis, septicæmia, disability, and delay in healing as preventable, and not as excusable, complications of osteomyelitis and of compound injuries. With this in view the line of treatment now known as the "Orr method" had been evolved. His first definite dissatisfaction with the ordinary methods of dealing with these conditions had been felt during his military service in France, in observation of the bad results following the antiseptic treatment of infected wounds and of compound fractures in particular. In referring to the original address of Lister, given before a meeting of the British Medical Association on August 9th, 1867, he found that wounds were to be protected against trauma and chemical irritation as well as from bacterial infection. This part of the programme we were neglecting in the ordinary routine of dealing with compound injuries. Ten years ago Mr. Winnett Orr had found that a drastic reduction in the number of dressings to which a wound was subjected caused a decided improvement in the healing of the wound and in the general condition of the patient. The main reason for this was that the introduction of additional organisms from outside was reduced, and that the wound was not irritated. The next stage had been to dispense with the secondary dressings. At first the treatment was applied to the chronic cases only; later more actively infected cases and more serious cases were found to do remarkably well under the same régime. The essential principles were: (1) the provision of really adequate drainage to every part of the wound at the first operation; (2) complete immobilisation of the limb in the best position attainable in a complete plaster-of-Paris cast; (3) débridement and thorough cleansing of the wound before encasing it in plaster, and no further dressing at all for four to six weeks. Every step of the method had been worked out by him, and he did not believe that modifications gave successful results. Where reports were made to him, as they were from time to time, of lack of success in applying the method, he found that either there had not been sufficient drainage, the application of the cast had given inadequate fixation, or the surgeon had been persuaded into doing more frequent dressings to satisfy other people that the wound was really going on well.

Mr. Winnett Orr showed a film illustrating the treatment of a compound fracture by his method. The fixation and extension of the limb were secured before operation was begun and not relaxed until the plaster was set. The operation of débridement and cleansing of the wound followed. Dead and dying tissue was removed and the wound was "saucerised," leaving a shelving edge. No sutures were inserted, and loose fragments of bone were not removed. The cavity was wiped out with iodine and packed with a sterile vaseline gauze pack, and the entire wound was covered with dry absorbent wool. The plaster cast was then applied, including in it the fixation apparatus, in this case an ice-tongs calliper. The first dressing was shown, done through a window in the plaster after four weeks, the cast being subsequently repaired. Mr. Orr also showed X ray photographs illustrating a case in which he had bridged a gap in a septic compound fracture, by means of a bone graft, with complete success.

Mr. R. F. J. HENRY (Dublin) said that for the last 18 months he had treated all cases of osteomyelitis coming under his care by the method advocated by Mr. Winnett Orr, and there could be no question of the suffering that had been saved to the patients by cutting out of the treatment the frequent and painful dressings which were a usual feature of these cases. The only real drawback to the method was the smell. This could best be controlled by nursing the patients in the open air on a balcony. He had also found it useful to cover the outside of the plaster with a layer of wool moistened with eusol. The covering of pus that formed below the dressing he believed to be definitely beneficial to the healing of the wound. The strictest attention to detail was essential if the method was to be successful, especially in the preliminary débridement and saucerisation of the wound. In compound fractures it was his habit to practice a limited débridement. In the old osteomyelitis case he thought he could hasten healing by removal of the sequestrum if present. Maggots had been advocated in the treatment of these chronically septic wounds; he was inclined to think that the success of treatment with maggots should be attributed to non-interference with the wound.

Prof. D. P. D. WILKIE (Edinburgh) congratulated two American surgeons on the amount of pain their researches had saved to children. Dr. E. C. Davidson, by his tannic acid treatment for burns, and Mr. Winnett Orr, by his method of treating cases of osteomyelitis with the minimum of dressings, had between them revolutionised our children's wards. Chronic osteomyelitis might follow on an acute infection, or it might be chronic from the start. In the very long-standing case with a discharging sinus which might have been present for 20 years, he was not convinced of the wisdom of operative interference; some patients actually refused to have the sinus closed, believing that it had some excretory value. The more recent case of chronic osteomyelitis he treated by the method described by Mr. Orr. Although he condemned diaphysectomy as a routine operation in acute osteomyelitis, once the acute stage was over he thought it was useful in hastening healing. Under the age of 17, regeneration of the bone could be relied on.

Prof. F. H. ALBEE (New York) confessed to having had many misgivings, but now proclaimed himself a complete convert to the Orr method. He had been making a special study of the flora of wounds. He thought it probable that the success of the Orr method would prove to be due to the development of a bacteriophage in wounds which were left for a long time undisturbed. From experiments in test-tubes it was known that a bacteriophage did take some considerable time to develop, and in wounds treated by frequent dressings there was no opportunity for this. He had hope that in the future more active bacteriophages might be cultivated outside the body, which by their introduction into wounds would help still further the process of healing.

Sir WILLIAM WHEELER (London) pointed out that Mr. Winnett Orr's dissatisfaction with the Thomas splint as a fixation apparatus was really a criticism

of the badly applied Thomas splint, while the success of Orr's own methods was absolutely dependent on adequate application of the plaster splint. In the late war the mortality from compound fractures had diminished very markedly after the use of the Thomas splint had been introduced on the field. It had been found that, granted the limb was fixed adequately on a Thomas splint, the patients lived in spite of the absence of proper attention to the wound before removal down the line. Another lesson of the war had been that, contrary to expectation, bone grafts stood infection surprisingly well. Two great advantages of the Orr method were that the temperature settled after application of the fixation and that the patients could be transferred to their own homes in between the times for dressings.

Prof. M. G. O'MALLEY (Galway) described the fate of 36 cases of acute osteomyelitis. Twenty had been treated by the Orr method, with one death on the sixth day from septicæmia. These cases had had an average of two to three dressings each. Sixteen patients had been treated by the old method, and of these four had died. Two of these deaths were probably unavoidable by any method, but the other two who had died of prolonged sepsis might well have been saved by the Orr method of treatment. The best way of combating the smell was by thorough ventilation. He did not advocate removal of the shaft of the tibia for osteomyelitis of that bone.

Mr. B. WHITCHURCH HOWELL (London) said he was strongly in favour of absolute immobilisation of compound fractures in plaster-of-Paris, especially in the presence of multiple wounds, and of dispensing with meddlesome dressings. His preliminary treatment of the wound included application of a thin smear of spirit and B.I.P.P., not more than 1 drachm of B.I.P.P. being used for all the wounds of any one patient. He sewed up the wound lightly over this dressing. Diaphysectomy he described as a crime.

Dr. M. S. HENDERSON (Mayo Clinic) paid tribute to the distinct advance in treatment of chronic osteomyelitis brought about by the Orr method. The main difficulties in the application of the method were met with in compound fractures or osteomyelitis at the lower end of the long bones, where complete saucerisation of the wound was obviously impossible. To diminish the smell, it was his practice to remove from time to time the outer dressings through a window in the plaster. He gave the patients oil of wintergreen to smell.

Mr. A. J. d'ABREU (Waterford) had found that the use of acriflavine and spirit in place of plain vaseline in one case had appreciably lessened the smell.

Mr. J. K. MUNRO (London) drew a comparison between septic wounds of bone and perianal abscess. Both needed the same wide exposure to prevent superficial healing with deep sepsis remaining. The cases that did not do so well with the Orr treatment were those with a large amount of discharge. In practice these were found to be cases in which there was dead bone present, and those in which there had been an extensive skin loss. He had found that a properly prepared skin graft would take under the plaster, even in the presence of severe infection.

Mr. WINNETT ORR, in reply, said he did not agree with Mr. Whitchurch Howell that diaphysectomy was a crime; in a few cases he thought it was necessary. Sequestration could best be avoided by adequate drainage. On the whole he condemned the drill-hole method of dealing with acute osteomyelitis, although in a few cases of severe infection it might be life-saving. He did not think that acriflavine would be active for more than a few minutes in these septic wounds. He saw no advantage in the introduction of B.I.P.P. The question of smell was very closely associated with the presence of moisture in the wound. He would not relax the rule about no dressings, whatever the pressure from nurses or others associated with the case. No one except the surgeon in charge of the case should ever dress it. Mr. Malley's figures were interesting, for although representing the results in only a short series of cases, they were in agreement with the general results obtainable. The mortality from osteomyelitis treated by the ordinary methods was 25 per cent.; by the Orr method it was 4 to 5 per cent.

Fractures of the Spine

Prof. W. S. HAUGHTON (Dublin) read a paper on the Transportation and Treatment of Spinal Fractures. He made a strong plea for the transportation of cases of suspected fracture of the spine in the prone position with a support under the chest to give hyperextension. Patients with fractures of the cervical spine should be carried lying on the back with a sandbag under the neck to extend it. All ambulance corps should be taught to follow out these instructions. In crush fractures of the spine the earliest possible diagnosis and treatment were essential if good results were to be obtained. Wedge-shaped vertebræ, the bases of the wedge being posterior, were found in neglected or undiagnosed cases. Prof. Haughton's method of dealing with these cases was to reduce the fracture by laying the patient prone with the chest on one table and the rest of the body on another table. The feet were then gradually raised upwards and backwards by means of pulley and cord attached to the ceiling. The spine was thus hyperextended, and with the patient supported in this position a posterior shell was applied. An anterior shell was also made, and the patient lay on the posterior shell by night and the anterior shell by day.

SECTION OF DISEASES OF CHILDREN

AT a meeting of this section held on July 28th, the chair being taken by Dr. KATHLEEN LYNN, a discussion on the value and dosage of

Vitamins in Pædiatric Practice

was opened by Mr. L. J. HARRIS, D.Sc. (Cambridge). Nutrition, he said, could not be left to instinct, or to the use of natural unspoilt foods or to a varied diet or to a process of free selection. The results of neglect of scientific principles could be seen in the mortality-rates among young children in the eighteenth century, while to-day official reports showed that a very high proportion of the London school-children suffered from some degree of rickets. Indeed, he continued, it seemed that under climatic conditions in this country rickets was almost inevitable if special prophylactic measures were not taken, since no common foodstuff contained sufficient antirachitic vitamin. While cod-liver oil had proved of great value in the past, it was, he said, sometimes impracticable to give the full protective dose, and experience pointed to ergosterol as the most certain remedy. From a practical standpoint Dr. Harris thought it an advantage to use a food (for example, a proprietary dried milk preparation) in which the requisite amount of irradiated ergosterol had already been incorporated by the manufacturers. Ultra-violet light therapy had given good results, but there were administrative difficulties in using this method wholesale and the dosage of vitamin D was uncertain.

Irradiated milk he thought was probably of great value, but there was still need of further standardisation of the processes employed in manufacture. For curative treatment he also urged the use of irradiated ergosterol, but whether used for prophylaxis or cure it was of the greatest importance to employ the correct dosage. The directions given by the manufacturers should in every case be rigidly followed, and there was need of more use of the international standards and of clinical standardisation. For prophylaxis a dose of 1500 international units a day for children between one and two years of age appeared to be the best; this was equivalent to about five teaspoonfuls of good cod-liver oil. For curative purposes the dose should be in the neighbourhood of 3000 units with a maximum of 5000. This, said Dr. Harris, was approaching the toxic dose which for infants began at about 10,000 units, and he discussed the risks and clinical features of hypervitaminosis, concluding that with such a valuable remedy the danger of overdosage was no reason for forbidding its employment altogether.

Summarising available evidence on the mode of action of the vitamins, Dr. Harris remarked that while vitamins A and C were of more importance in cytological changes, vitamins B and D controlled more certain chemical processes. The antirachitic vitamin was responsible for regulating the level of the calcium and phosphorus in the blood through the medium of the rate of absorption of these substances from the intestine. It followed that it was the best means of preventing the rickets of cœliac disease and for the treatment of infantile tetany. For tetany he disapproved the use of parathormone except as an emergency remedy, since this secretion did not increase the absorption of calcium and phosphorus and even led to a net loss to the body as a whole. In conclusion he spoke briefly of the need for more investigation into the effects of extra vitamin B added to the infants' diet and of the need to give vitamin C to all infants. Adequate nutrition under existing economic conditions being impossible for certain sections of the community, it was doubly necessary for our scientific knowledge of nutrition to gain wide recognition and be applied in practice.

Dr. W. R. AYKROYD (Health Section, League of Nations) said that public health authorities in many European countries were awakening to the fact that public health activities must be concerned with dietetics. But there was a widespread ignorance both of details and of the broad principles of dietetics and knowledge diffused slowly; malnutrition was still associated with lack of intelligence and education. He gave examples of the effects of a diet deficient in vitamin B_2. Despite the clearest evidence as to how pellagra could be prevented the disease was on the increase in certain countries. In many areas a diet too largely composed of cereals was in use leading to sickly and under-developed children, and it was claimed that the giving of the vitamin-B complex improved the growth and nutrition of infants. The dose of vitamin C in orange juice had been standardised and vitamin A was generally present in sufficient quantity in whole milk of a good quality. The recent report on vitamins by the Medical Research Council had suggested that vitamins should be added to the diet of mother and child in all breast-feeding. In older children the deficiency diseases were more complex, but it was clear that a diet must contain adequate amounts of certain foodstuffs such as milk, butter, and eggs, and in judging the worth of a diet it was best to take these more valuable foods into consideration rather than to pay too much attention to special factors. This had the advantage of being understood by the public.

Dr. COLMAN SAUNDERS (Dublin) said that in Dublin it was unusual to find a baby between one and two years of age not suffering from rickets. The disorder was not uncommon in the breast-fed infant and here the diet of the mother was of great importance. He thought that breast milk on an average did not contain more vitamin D that cow's milk, but the baby got more breast milk and got it undiluted so that the chance of vitamin-D deficiency was lessened. Vitamin D ought to be added to the mother's diet or even given to the breast-fed infant. In the artificially fed baby, he continued, imbalance was frequent and in adding vitamin D it must not be forgotten that the whole diet must be revised and corrected. He agreed with Dr. Harris as to the optimal dosage of vitamin D for protection and for cure; he gave egg yolk to premature babies both for its vitamin and iron content. Tetany he thought was often present in a latent form, and accounted for the great majority of convulsions from three months of age onwards. He had found the paroxysms in whooping-cough and fits in children of school age benefited by extra vitamin D and calcium in the diet.

Dr. H. E. MAGEE (Aberdeen) drew attention to the loose use of the word "nutrition." It was important, he said, to consider the whole question of the intake and the output of essential foodstuffs as well as digestion, absorption, and metabolism. He was convinced of the great importance of balance in the diet and mentioned some experiments concerned with the optimal concentration of calcium in the bowel for the absorption of glucose. In conclusion he stressed the value of estimating the phosphatase in the blood as a delicate indication of impending nutritional breakdown.

Dr. S. W. CLAUSEN (Rochester, U.S.A.) mentioned more experiments in relation to the giving of extra vitamin B in the diet of children who were hypotonic, with poor appetites, and were not gaining weight. The work had been, unfortunately, not adequately controlled and improvements obtained might have been due to an increased carbohydrate intake. With regard to vitamin-A deficiency the theory of increased susceptibility to infection was attractive but experiments were difficult, since no pure source of vitamin A had been available until recently. The study of carotene in the blood, however, had shown only slight correlation between the presence of this substance and the susceptibility to infection. Attempts were being made at present to cure xerophthalmia by carotene.

Dr. H. P. WRIGHT (Montreal) thought the medical profession knew too little about vitamins and the general public too much. He mentioned some experiments made with vitamin A in relation to preventing the common cold, in which the results were negative. Recently he had been using potatoes as a source of vitamin C; ordinary mashed potatoes were effective both for the prevention and cure of scurvy. Four teaspoonfuls daily were needed to prevent and eight to cure.

Prof. L. G. PARSONS (Birmingham) warned his hearers that the statistics presented to them dealing with the prevalence of rickets were not in agreement with clinical experience; he did not see anything like the number of cases of rickets now that he did some years ago. He stressed the value of irradiated milk; recent work by Hess showed that the vitamin D obtained in this way worked better in the tissues than that from irradiated ergosterol. He added that pellagra was not unknown in this country.

Dr. CATHERINE CHISHOLM (Manchester) dealt with the value of heliotherapy which even in a town like Manchester was of proved value in preventing rickets. She thought "good mothering" a most important aspect of the prevention of rickets; it was easier for the mother to give cod-liver oil than to measure out small doses of irradiated ergosterol.

The CHAIRMAN thought that abolition of smoke over big cities would go a long way to abolish rickets. Since man was an "irradiated animal" in his natural state there was much to be gained by a return to this state as regards clothing and housing.

Dr. EDOUARD CERESOLE (Lausanne) read a paper on childhood, common sense, and medicine. He pointed out that while the breeding of animals had reached a high scientific level, little interest was shown in the hygienic aspects of breeding in the human species. He thought pædiatricians still showed too much leaning towards the diseased state rather than towards preventive medicine. Even in his own country they were behind in matters of general hygiene; fresh air, for instance, was still too often shut out of institutions. In England the contrast between the fine physique of the public school boy and that of the child from the poorer districts showed strikingly the effect of environment. It was more logical to order sunshine than vitamins, and he stressed the value of sleeping out of doors all the year round.

SECTION OF PHYSIOLOGY AND BIOCHEMISTRY

AT the meeting of this section, Prof. T. H. MILROY (Belfast), the president, being in the chair, a discussion on the

Nervous Control of Abdominal Viscera

was opened by Prof. D. T. BARRY (Cork), who dealt with the rôle of the parasympathetic and sympathetic systems in the regulation of muscular movements and of vascular conditions in the abdominal viscera. The method adopted for experimental investigation was described in the *British Medical Journal*, 1933, i., 956. In the dog cardioinhibitor fibres may be found arising at a low thoracic level; in man all cardiac branches are said to rise above the root of the lungs. Prof. Barry has twice unwittingly stimulated these fibres below the root of the lung in the dog, once with a fatal result. When either vagus nerve is excited by a fairly strong current a balloon in most parts of the small intestine shows some degree of external pressure upon it. Stimulation of one or both nerves gives rise to the contraction in varying degrees. The antagonistic action of the splanchnic tone and vagal muscular impulses is demonstrated by tambour readings before and after splanchnic section. Atropine annulled vagal contraction experimentally both before and after splanchnic section, but it is increased by acetylcholine or pilocarpine injections, showing that the fibres concerned are of true parasympathetic nature. Measured electrical stimulation demonstrates the gastric vagal chronaxia to be diminished by splanchnic section. Stimulation of the great splanchnic nerve produces, as has been generally recognised, inhibition of the gut, but also excitatory actions, both rhythmic and tonic or peristaltic in type. In a given reaction from excitation of one branch of the double system of nerve-supply, certain elements received by communication from the other branch may be responsible for the result. What is the type of the vagal fibres supplying the stomach? Intracranial vagal stimulation is reported to have given gastric motor responses. While there is evidence to show that the motor fibres to the stomach are parasympathetic, it is probable that the sympathetic fibres convey inhibitory impulses. More work has to be done to make clear the mixing of elements in the two systems. The hyper-hypotensive reaction is characteristic of fairly strong stimuli to both peripheral vagi; atropine does not annul the reaction. This vascular response was not intensified by vagotropic substances but was definitely annulled by injection of sympathetic paralysants. After section of the splanchnic nerves the vascular reaction to vagal excitation disappears or is modified considerably. The conclusion from experiments was that there are both hyper- and hypo-tensive fibres in the vagus nerve.

An interesting feature of vagal activity is the alteration in renal volume, excitation of vagus giving increase in some cases and marked decrease in others. Atropine had little or no effect on the renal constrictor response to vagal excitation. Acetylcholine, however, given in small doses caused first a hypotensive effect, which was accompanied by immediate renal shrinkage, followed by a phase of enlargement, and then again shrinkage. After atropine, however, the immediate effect of acetylcholine was markedly hypertensive. The disappearance of vagal hypotension after splanchnic section might suggest that vagal depressor fibres pass into the splanchnic system. The influence of the vagus in causing hypotension may be due to the counteraction of splanchnic vascular tone; but after splanchnic section, the vagal hypotensive reaction shows a tendency to recover. Different views upon the subject of sympathetic fibres in the gastric vagus may be partly explained by methods of investigation, physiological and pharmacological observations giving different results from histological and anatomical study.

Prof. B. A. MCSWINEY (Leeds) said that both vagus nerves mix in a plexus on the œsophagus; the innervation of structures in the abdomen therefore cannot be differentiated. Further, the spinal parasympathetic fibres supply the motor fibres to stomach and intestine through the greater splanchnics. On stimulation of the thoracic sympathetic trunk or splanchnics, contraction or relaxation of the stomach was obtained according to type of stimulus used (tetanising or one stimulus per sec.). Working on isolated nerve muscle preparations, results obtained point to liberation of a chemical substance (acetylcholine) at the periphery. While therefore it may be right anatomically to speak of two divisions of the autonomic nervous system, yet fibres in the sympathetic nerves may, in action and liberation of chemical substance, resemble fibres of parasympathetic and vice versa. The stomach is a good example, for contraction and relaxation may be obtained by stimulating nerves of either system.

Prof. J. R. LEARMONTH (Aberdeen) limited his remarks to nervous control of bladder and terminal colon in man. Defect of neuromuscular coördination leads to mega-bladder, mega-ureter, and mega-colon. Records were given of results of removing the presacral nerve in six cases with this syndrome. Three cases were completely relieved, one required division of internal sphincter of bladder, and two were unsuccessful probably owing to severe bladder infection.

Prof. JOHN BEATTIE (Montreal) said that lesions of the anterior hypothalamus have been shown to result in peptic ulcers. Stimulation of the tuber cinereum caused transient vasodilatation of the pyloric segment

of stomach and the proximal part of duodenum lasting about one minute, followed by blanching of serous and mucous coats with increased secretion of peptic juice. He suggested that this brain lesion is irritative, for if in atropinised animals the vagi are cut ulcers are not produced. Prolonged vagal stimulation may in this way produce gastric ulceration.

Dr. R. C. GARRY (Glasgow) spoke on the control of defæcation. In view of the prevalence of constipation it is, he said, surprising how little is known about the nervous mechanism controlling the evacuation of the large bowel. There are two stages in defæcation: (1) contraction of the distal colon; (2) dilatation of the anal canal which augments contraction of the distal colon. These reflexes depend on the integrity of the pelvic nerves and the lumbosacral region of the spinal cord.

Dr. H. E. MAGEE (Aberdeen) said that ergotoxine and atropine suppressed hyperglycæmia in normal rabbits after administration of glucose by stomach-tube, partly owing to delayed absorption causing inhibition of gastric discharge. In amytalised rabbits, atropine, splanchnotomy, and vagotomy increased the rate of absorption of glucose and the degree of hyperglycæmia. In decerebrate rats vagotomy increased the rate of absorption, whereas atropine had this effect in non-fasted animals only and depressed absorption in fasted animals. These results were more in favour of the view that alimentary hyperglycæmia is due to overflow of absorbed glucose through the liver than of the rival theories.

Urea in Health and Disease

Dr. W. R. FEARON (Dublin) said that urea is one of the simplest and most widely distributed forms of organic nitrogen. Its functions, other than the excretion of nitrogenous waste products, are numerous. It is a diuretic, a galactogogue, a solvent, and a precursor of urinary ammonia. Urea is formed almost entirely by the hepatic deamination of surplus amino-acids. J. W. Jessop (Dublin) has shown this formation of urea to be fairly constant. After the consumption of 80–90 g. of food protein, the daily output ranges from 25–30 g. Urea, owing to its unique diffusibility, is universally and fairly uniformly distributed throughout the animal—except in adipose and renal tissue. The normal range is 15–45 mg. per 100 g. fresh material, the average blood values being 18–38 mg. per 100 c.cm. One result of this diffusibility is that urea retention does not cause œdema. Physiologically two types of hyperuræmia may exist: (1) due to increased production; (2) due to decreased removal of urea. Both types are present in many clinical conditions—e.g., increased production of urea due to high protein consumption; fever or thyroxine administration causing increased metabolism and decreased excretion of urea; as a result of acute renal incompetence, chronic renal inefficiency, toxæmias of pregnancy, acute intestinal obstruction, diabetes mellitus, destruction of renal tissue, or starvation. Abnormally low values of blood-urea have been observed in conditions due to decreased urea genesis, acute hepatic inefficiency, and increased excretion—e.g., diuresis as in diabetes insipidus and other diabetic polyurias, lipoid nephrosis, and pregnancy. Uræmia can be divided into (1) simple uræmia or "urotoxæmia" due entirely to retention of urinary waste products, and (2) uræmia complicated by extrarenal factors—e.g., vascular, hypertension, diffuse arteriolar, and arterial disease. The biochemical syndrome of a simple uræmia following total nephrectomy in man has been described by G. Thompson (1932). The term "urotoxæmia" may be defined as the pathological condition due to retention of urinary solutes in blood. In normal subjects, blood-urea may be temporarily raised with transient symptoms of urotoxæmia; this experimental hyperuræmia is profoundly different from that produced by abnormal retention. It is possible that in sustained and increasing hyperuræmia the urea acts as a narcotic.

Prof. JOSEPH BARCROFT (Cambridge) said that the constancy of composition of blood qua pH, oxygen, and water was well known but not understood. Perfused organs would function within wide ranges of these factors. Variations in them seem to affect the mental rather than the bodily functions. Possibly urea acts in the same way.

Dr. GEOFFREY THOMPSON (Dublin) remarked that cerebral convulsions normally associated with uræmia may be due to spasm of the cerebral vessels or œdema, and are usually relieved by lumbar puncture. The term urotoxæmia was, he thought, preferable to uræmia to indicate the retention of urinary solutes in the blood.

Prof. J. S. DUNN (Glasgow) said that in experimental nephritis blood-urea could be raised to 600–700 mg. per 100 c.cm. with no permanent effect. If sufficient water is given urea has no effect per se; without water, dehydration and uræmia follow without any further rise in urea.

Food and Goitre

Sir ROBERT MCCARRISON (Coonoor, India), in a paper illustrated with lantern slides, said that the thyroid is not an organ whose size is unalterably fixed but one designed to adapt itself to environmental conditions; with variations in size there are also variations in histological appearance, the latter varying with the phases of the gland's activity. The factors influencing the size of the gland are multiple and include hereditary influences, individual idiosyncrasy, age, sex, sexual activity, psychical factors, season, locality, altitude, distance from sea, sanitary conditions, and diet. Of these diet is the most important. The thyroid has a profound influence on the metabolism of food. Hyperthyroidism increases nitrogen metabolism, mobilises hepatic glycogen, and inhibits the anabolism of fat. It appears to have a direct stimulating katabolic effect on the calcium deposit of bone and it controls the utilisation of iodine in the body. Conversely no organ is more sensitive to food conditions. Excess work may cause hypertrophy and subsequent strain fibrosis, or because of improper food the physiological efficiency of the gland may become impaired. The more perfect the constitution of the diet the more normal and less variable the size of the gland. Further the diet must be balanced. The chief excesses in ordinary diets are fats, lime, iodine, and certain unidentified substances in vegetable foodstuffs. An excess of fats or calcium favours goitre production, an effect neutralised by additional provision of iodine. Certain unidentified substances in some vegetables (probably cyanides) depress cell oxidation and are goitrogenic. Although not due to an iodine deficiency the goitres can be prevented by iodine, thyroxine, and manganese chloride, and to a less extent by thymol. Experimental goitre can also be produced by diets deficient in vitamins A and C. The antigoitrogenic value of foodstuffs, such as milk, oatmeal, green vegetables, and carrots, does not depend on their iodine content. Deficiency of oxygen, caused by constriction of the trachea or obstruction in the upper air-passages, was associated with an accumulation of colloid in the

vesicles of the thyroid. Deficiency of vitamins A, B, and C were known to affect the thyroid unfavourably and there was some evidence that vitamin D may not be without effect. There is, Prof. McCarrison concluded, no incontrovertible evidence that iodine deficiency is by itself the cause of goitre; nevertheless a low iodine intake may, in certain conditions of diet and hygiene, predispose to occurrence of goitre and be a determining cause of its endemicity. He gave figures showing interaction between faulty food and insanitary conditions in the causation of goitre. Rats fed on a perfectly constituted diet never developed goitre living under conditions of gross insanitation; fed on an ill-constituted diet 47 per cent. became goitrous. Of rats on a deficient diet and distilled water 39 per cent. became goitrous, whereas on the same diet and polluted drinking water the percentage of goitre was as high as 89.

REVIEWS AND NOTICES OF BOOKS

Mental Deficiency

Stoke Park Monographs on Mental Deficiency and other Problems of the Human Brain and Mind. No. 1: The Burden Memorial Volume. Edited by RICHARD J. A. BERRY, M.A., F.R.C.S., F.R.S.E., Director of Medical Services. London: Macmillan and Co., Ltd. 1933. Pp. 249. 10*s.* 6*d.*

THE group of institutions comprising the Stoke Park Colony bears the honour of being the first of its kind to be certified under the Mental Deficiency Act of 1913, and this volume is fittingly opened with a tribute to the Rev. H. N. Burden for his initiative as founder and for his encouragement, financially and otherwise, of research, a work still liberally continued by his widow. For eleven out of the seventeen contributions Dr. Berry is responsible, either in whole or in part. Some of these were written while he still held a chair of Anatomy in Australia, and it is natural that the book should be dominated by an interest in the modifications of cerebral structure associated with mental defect rather than its psychological aspects, although these are not neglected. Dr. Berry quite frankly confesses that "the study of cerebral insufficiency is more fascinating than the legally restricted one of mental deficiency." Measurements of brain capacity, general physical data, height, weight, and sitting height, and psycho-physical measures of grip and vital capacity figure largely in the system of diagnosis employed at Stoke Park. Dr. Berry appears in one passage to agree with the opinion of most diagnosticians that head measurements are "only ancillary," but in another he hails the same measurements as "a distinct advance in scientific diagnosis."

Such inconsistencies and a tendency to generalisations of doubtful validity are not uncommon in the book. One may agree that normal postnatal brain development depends on the growth of the supragranular layer, while hesitating to accept the statement that in a premature arrest of its development "lies the physical basis of the majority of cases of pauperism, vice, crime and other forms of social inefficiency." That Dr. Berry is himself doubtful appears only a few pages later when he says "here is the physical basis of at least a percentage of pauperism, vice and crime"—obviously a much more guarded statement. It is also not clear what is the evidence for the assertion that at least 2 per cent. of school-children are defective, unless it be that the author is still influenced by the Australian freedom from a legal definition of mental defect.

The note by Dr. R. G. Gordon and Dr. R. M. Norman on some psychological experiments on defectives on the lines of Köhler's work on chimpanzees is of particular interest, as is also Dr. Norman's contribution on neurological abnormalities in the defective, and that of Dr. R. M. Bates on some curious developmental deformities in individual cases. The chapter on heredity by Dr. Berry adds nothing to existing knowledge, but his dictum that "it is the non-certified parents rather than their segregated and defective offspring whose sex instincts require some form of public control" may be commended to the consideration of ardent advocates of sterilisation of mental defectives.

The sections on brain structure, both normal and abnormal, are lucidly written and adequately illustrated, some photographs being included of original models by Dr. Berry from the laboratory at Stoke Park. The illustrations throughout the book are excellent, but it may be questioned whether the chapter of pictorial records of defectives serves any material purpose. While the authority of Dr. Berry and his colleagues cannot be questioned in matters anatomical and neurological, his philosophy might not find so ready an acceptance, and when he asserts that "it cannot be long before the brain gives up the last of its secrets—the fashioning of mind out of the functions of neurones and their synapses," there will be some at least who will ask if mind is thus fashioned. The interest of the book is, however, primarily anatomical and neurological, and as such it occupies a place of its own in the literature in English on mental defect and merits careful study.

Neuropathology

The Anatomical Foundation of Nervous Diseases. By WALTER FREEMAN, M.D., Ph.D., D.N.B., F.A.C.P., Professor of Neurology, George Washington University; Director of Laboratories, St. Elizabeth's Hospital, Washington, D.C. London: W. B. Saunders Co., Ltd. 1933. Pp. 349. 20*s.*

MANY advanced works have been published in recent years dealing with special aspects of neuropathology, particularly with its cytology. Very little has been available for the student who wishes to acquire easily a bird's-eye view of the subject. Prof. Freeman was happily inspired therefore in his attempt to supply this need and may be congratulated on his success in presenting the results in a volume of very reasonable size and attractive form. His desire to bring the pathology of the central nervous system into line with that of the rest of the body will meet with sympathy from the general pathologist. In the past the neurological pathologist has tended to magnify the differences between the central nervous system and other tissues, which we have heard referred to in neurological circles somewhat contemptuously as the "trunk tissues!" These differences have been accentuated in part by the necessity of using peculiar histological techniques and also by the neuropathologist's elaboration of an ultra-pedantic vocabulary. Prof. Freeman wisely appends a glossary to his work, so that the student will be able to translate these into terms of ordinary pathological experience.

The survey given of the pathology of the central nervous system is comprehensive and for the most part succinct. The text, which is admirably illustrated

with numerous photographs of gross and microscopic specimens, is full of the author's personal observations and is thus more readable than the average text-book. The personal factor, however, has its drawbacks, and it would appear that the matters which are of chief interest to the author have been expanded to the detriment of other important subjects which receive rather scanty treatment. For example, the space devoted to the changes in epilepsy, none of which are unequivocal, is twice as great as that given to hydrocephalus, concerning the production of which a good deal has been learnt within recent years. Syringomyelia, again, is dismissed very shortly without reference to its association with intramedullary tumours of the cord: an association that is common and possibly highly significant. A very hazy impression remains after reading the paragraph on blood-vessel tumours of the brain. On the other hand such subjects as these are for the most part fully treated in monographs which can be consulted at need.

One of the chief merits of this book is that it gives information upon a number of subjects that have not been written up in an easily accessible form, such as the functional psychoses, Pick's disease, fungus and parasitic infections, and so on. The section on post-mortem changes and artefacts is good and is appropriate in a book of this kind. It should enjoy a considerable popularity among those interested in neuropathology.

Urologie infantile

Par les Drs. BEER et HYMAN. Traduit de l'Américain by le Dr. FRITZ BUSSER. Paris: Gauthier-Villars. 1933. Pp. 262. Fr.40.

THE appearance of a French edition of Beer and Hyman's excellent monograph is a reminder of the highly specialised nature of the urology of childhood, which calls for the association of urologist and pædiatrician. The authors are well qualified to write from their extensive experience at the Mount Sinai Hospital, New York, and as their book is one of the few devoted exclusively to this subject, it is appropriate that it should be made available to a wider audience. The technique and limitations of the various methods of investigation are discussed in considerable detail and illustrated by a number of excellent radiographs. It is perhaps a pity that opportunity was not taken in the present edition (which is translated from the American edition reviewed in THE LANCET two years ago) to include some reference to the use of ketogenic diet in pyuria in childhood, and the absence of an index is also regrettable. In other respects the book is thorough and well documented, and provides a useful review of the subject.

Cardiovascular Pain as a Biochemical Problem

By GORDON LAMBERT, B.A., M.D., B.C. Cantab., Senior Hon. Physician and Physician in charge of Electrocardiographic Department, Royal Berkshire Hospital; Cardiologist to the Ministry of Pensions, Reading Area. London: H. K. Lewis and Co., Ltd. 1933. Pp. 75. 6*s*.

IN view of the title of this book it is surprising that the biochemical aspect of cardiovascular pain is not touched on till we are completing the first part. The rôle of infectious disease in cardiac and arterial degeneration is considered in a rather sketchy fashion, and direct reference to the biochemical problem is not made till the views of Starling and Mackwalder on the dilatation of the coronary arteries by non-volatile metabolites of the heart muscle itself are set out. The main subject of the book is then ignored till mention is made of "vagus substance," which is considered to be liberated in the heart by the vagus nerve and is probably an acetyl derivative of choline. Finally in the concluding section a few more very brief references are made to biochemistry, mostly in quotations from various authorities. If this book is intended to be a serious contribution to the problem of a biochemical cause of angina pectoris, it cannot be said to succeed; if, however, it is merely intended to arouse interest in this aspect of the problem without offering considered theories, it fulfils its object, in spite of a rather rambling style, due to profuse quotation, interspersed with illustrative cases and diagrams. As an introduction to the problems involved it has the merit of opening up many sides of a complicated subject.

The Chemistry and Physics of Contraceptives

By CECIL I. B. VOGE, B.Sc., Ph.D., F.R.S.E. London: Jonathan Cape. 1933. Pp. 288. 12*s*. 6*d*.

THIS volume contains a valuable and painstaking summary of the constituents of the many proprietary spermicidal preparations with which the market in this country has recently been flooded. Dr. Voge also gives particulars of laboratory tests which may provide a rough index of the clinical reliability of the preparations. His book will prove helpful to research workers rather than to clinicians, since there emerge from the mass of details which it contains few practical conclusions, except that of the many spermicidal preparations now available the foam jellies satisfy most of the author's theoretical requirements. There is no means of forming a valid judgment on the newer of these preparations by reason of the lack of clinical evidence to substantiate the often extravagant claims made for them. Dr. Voge's discussion of the manufacture and marketing of the rubber condom or sheath will be of interest to those advising the use of these articles.

The book is profusely illustrated, and contains numerous tables which are not always easy to follow; and the reader is apt to lose his way in the references to and quotations from other workers, which, as often as not, produce the effect of confusing rather than of clarifying the essential argument.

Roman Catholic Methods of Birth Control

By MARIE CARMICHAEL STOPES, D.Sc., Ph.D. London: Peter Davies. 1933. Pp. 235. 6*s*.

IT is here argued that the means of regulating conception permitted by the Roman Catholic Church can, according to the most acceptable definition of the phrase, be described as falling within the category of "birth control methods." Contraception or birth control is defined as "the use by either sex of any means whatsoever whereby coitus may be experienced, while at the same time the fusion of the ovum with the spermatozoon may be averted so that conception does not take place." This definition clearly excludes abstinence from the category of birth control methods. But it does not exclude the use of the so-called safe period which is allowed by Roman Catholic moral theologians and which, by implication, is sanctioned by the papal encyclical of 1930. Nor does it exclude coitus reservatus or karezza which must clearly be distinguished from coitus interruptus. The latter involves coitus, withdrawal, and seminal emission,

described theologically as pollution. This is the sin of Onan, and is condemned by the Roman Church. Coitus reservatus differs from the above in that no emission should take place, and Dr. Stopes gives reasons for supposing that, though not referred to directly or indirectly in the encyclical, it is not regarded by the Catholic Church as sinful. The sinfulness apparently resides in the intention of the male partner to have an ejaculation. Thus Father Thomas Slater is quoted as stating, in a book which carries the imprimatur of Rome, that if the act of coitus reservatus is attempted, the intention being that no ejaculation should occur, and if the strength of the man should fail in such a way that an emission resulted, then the man is blameless, and there is no sin. The psychological distinction between an innocent act and a mortal sin is therefore a delicate one, and Dr. Stopes alleges that in this matter the doctrines of Rome are balanced on a knife edge. This argument is forcibly presented in the first part of the book.

In the second part are described the methods employed by Roman Catholic moral propagandists to defeat the birth control movement. Figures are further submitted which show that, relatively, Roman Catholics are very prolific, and that a disproportionately large number of them become, in certain parts of England and Scotland, dependent on public assistance and, in other parts of the world, criminals. Dr. Stopes therefore argues that, in view of the claims made in this country by Roman Catholics for maintenance by the majority of persons who do not share their religion, they should not oppose the creation for these of birth control facilities of which they need not, but in the general interests might profitably, avail themselves.

NEW INVENTIONS

A NEW FLOW METER

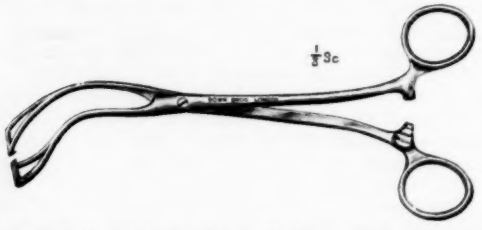
FEELING the need for a flow meter on oxygen valves to indicate the quantity of gas which is being allowed to flow, I have designed the fine adjustment valve, here illustrated, with flow meter combined in one piece. It has been tried out during the past year, and has proved very useful, especially for anæsthesia. It incorporates my fine adjustment regulating valve, and the absence of joints and unions obviates leaks.

The meter is made by the Manchester Machine and Instrument Manufacturing Co. Ltd., of 2, Booth-street, Manchester.

K. B. PINSON, M.B., Ch.B. Birm.

TONSIL-HOLDING FORCEPS

THE forceps shown in the illustration is a modification of Duval's peritoneum pattern. The blades are curved to almost a right-angle with the handle, so that when the tonsil is grasped there is ample room for the use of scissors or other instruments to carry out the enucleation. It has some advantages inasmuch as the tonsil is held firmly and may be drawn well out of the tonsillar fossa. No damage is inflicted on the tonsil and the view of the operation field is not restricted. The instrument is extremely light and in practice works well. A smaller size should be used for children.



Messrs. Down Bros., St. Thomas's-street, London, S.E., have carried out my suggestions in making this instrument.

T. H. R. MCKIERNAN, M.B., B.Ch.

A PORTABLE IRRIGATOR

INTESTINAL lavage has for the past few years been recognised by urologists, general surgeons, and physicians as valuable for many purposes. As a preliminary to X ray examination of the kidney it is the only certain means of excluding gas from the radiograms—a matter of considerable importance in pyelography. In the treatment of diseases of the urinary system it is of great use in pyelitis and cystitis, and for expulsion of small urinary calculi because of the profuse diuresis it induces.

The apparatus here figured, which is made of rubber, can be used on a lavatory seat with a ring cushion. If required for a bed patient, a special rubber bed-pan can be used. In using the apparatus the tube should first be lubricated with vaseline and passed gently into the rectum. The patient sits upon the cushion with one arm of the tube in the rectum and the other between the buttock and cushion. Thus a firm pressure is exerted to prevent the tube from being pushed out. When the bag is filled with fluid at body temperature and is suspended two or three feet above the pelvis, the fluid is allowed to flow slowly into the rectum by the regulating clip. The desire to evacuate should be produced by the flow of one pint of fluid in the first instance and a half pint thereafter. As soon as the slightest discomfort is felt from distension, the flow should be stopped. It will generally be found that the bowel will evacuate about ten times to the gallon of fluid, equivalent to about ten days' evacuations. With appropriate nozzles the apparatus can be used by the surgeon for intra-uterine washouts, and for vaginal or bladder washouts.

The apparatus is made to my design by the Surgical Manufacturing Co. Ltd., of 83/85, Mortimer-street, W.1.

MORTON WHITBY, M.R.C.S. Eng.
Genito-urinary Department, West London Hospital.

THE LANCET

LONDON: SATURDAY, AUGUST 12, 1933

THE HOSPITAL DIETITIAN

THE scope of the hospital dietitian and the training required to fit her for her duties are questions which are now engaging the attention of authorities of municipal as well as of voluntary hospitals. At a recent meeting the central public health committee of the London County Council reported to the Council the results of an inquiry into the usual conditions of training for a type of office not long established in this country, though common in American hospitals. The outcome is a recommendation for the training in dietetics, as an experiment, of six State-registered nurses chosen from among those already employed at the Council's hospitals. It is proposed that the selected candidates should take advantage of a special diploma course to be inaugurated at King's College of Household and Social Science in October next; the course is for one year only, the first half being spent at the college and the second half in the main kitchen (one and a half months) and special dietetic kitchen (four and a half months) of a hospital. The fee for the course is £30, to be paid by the Council for their six selected candidates, who will undertake to work in their service for three years after obtaining the diploma. The permission to reside in the hospitals to which they are at present attached for the first part of the course, and the allowance of full pay during training, will enable the nurses to take advantage of the opportunity without substantial outlay; presumably they will be given board and lodging at the hospital which receives them for the second part, since they will give service under supervision while studying the administrative work and practising the calculation and preparation of special diets.

It is noteworthy that this brief course of training is expected to produce a dietitian fit to undertake responsibilities far greater than those entrusted by most of the voluntary hospitals to the head of the department. The scope of such departments in this country is generally limited to the management and organisation of a special diet kitchen; the calculation of special diets ordered, and their preparation and service, in coöperation with the ward sister; the instruction of certain patients leaving hospital and of out-patients—for example, those with diabetes and anæmia; and the teaching of nurses in the theory and practice of dietetics. The duties of the officer in charge do not yet as a rule extend to the main hospital kitchen, to the purchase of food, or to the planning of menus for patients or nursing staff. It must surely be only a matter of time before the services of an expert are enlisted in large resident institutions not only to superintend laboratory-prepared and experimental diets, but also to take charge of the whole of the food-supply; for it is not the quality of the foodstuffs purchased but the lack of imagination in their choice, and of attention to variety, cooking, and service that is the subject of legitimate complaint in most institutions. The London County Council show wisdom in proposing that "thoroughly responsible and well-qualified officers" shall undertake the general organisation of the feeding arrangements in hospitals, as well as the provision of special diets for special patients, and we are in cordial agreement with this wide view of their responsibilities. It seems exceedingly doubtful, however, whether a short course of training will fit even a nurse of quite unusual abilities for such complex duties. The supply of eligible candidates will not, we imagine, be great, for we understand that admission to this special diploma course is limited to those State-registered nurses who can satisfy the authorities that they have spent at least two years in studying science at courses of a university standard. It seems likely that better results would be obtained by insisting, as do two at least of the voluntary hospitals — St. Bartholomew's and University College Hospitals—on the possession of high qualifications, notably a science degree as well as special experience, in their dietitians who, by the way, are not trained nurses. Doubtless, other things being equal, a trained nurse would have preference in such appointments, if only on grounds of enlarging the scope of the work available to a nurse after registration. But the real essential is a thorough training in domestic economics and the chemistry of foodstuffs, as well as in the science of nutrition and its intelligent application. The latter depends not only on knowledge of the basic sciences, but on a cultural background which cannot hastily be acquired. It would be most unfortunate if the organisation of a much needed hospital department were to fail because the persons chosen to inaugurate it had not the equipment and status required to carry through necessary changes. It is to be hoped at least that the shortened course at King's College will not attract students to the disadvantage of their admirably planned degree course, and that the standards of previous education required in candidates admitted to it will be maintained at a high level.

INDUSTRIAL PULMONARY DISEASE

IN a highly industrialised country such as Great Britain, dealing with an enormous variety of raw materials and employing perhaps an equal number of manufacturing processes, there is little need to emphasise the importance of the study of occupational disease. Certainly it has not been overlooked by the compilers and interpreters of our national statistics, for the valuable series of studies of occupational mortality, issued at ten-yearly intervals by the Registrar-General, was initiated by FARR as long ago as the middle of the last century. On the other hand, workers in this particular field of hygiene will be the first to admit that the detection of the industrial risk, its isolation from other environmental and, possibly,

heritable factors, and the measurement of the ill-health for which it is specifically responsible, are amongst the thornier problems of vital statistics. Where the disease, like anthrax or specific chemical poisoning, rarely occurs amongst the population at large, there is usually little difficulty in fixing the occupational origin and in taking steps to reduce the risk. But where the disease is one which frequently attacks the general population difficulties begin to bristle. The mere appearance of the disease is then obviously no indication of an occupational origin; it must be shown that a group of workers has an abnormally high incidence from it and, further, that their mode of life is differentiated from an otherwise comparable sample of the general population only in the occupation that they follow.

Nowhere are these difficulties more apparent than in the study of pulmonary diseases, the incidence of which may fall with unequal severity upon industrial groups but whose clinical aspect mostly does not differ from the normal. Examples may be found in the reports of the Industrial Health Research Board on the incidence of phthisis amongst printers,[1] and of "bronchitis and asthma" amongst cardroom operatives in the Lancashire cotton-spinning mills.[2] Exactly why printers should die from tuberculosis at a relatively high rate has often been the subject of speculation but has never been solved—though many explanations have been put forward. To mention but one incriminated factor, does the night and high-speed work of newspaper production contribute to a breakdown in health? Here the obstacles to investigation are perhaps insuperable. The interchangeability of workers between newspaper offices and general printing leaves the observer with no clearly defined groups to study, for inevitably he has to accept the industrial organisation as it stands and cannot adjust, like the laboratory worker, his material to suit his ends. Though it has been said that tuberculosis in printers runs a peculiarly rapid course, there is really no evidence that in symptoms and development it differs from the normal case. Cardroom workers' "asthma" is another example of an industrial pulmonary disease which in its clinical course is not clearly distinguishable from the bronchitis, emphysema, and their concomitants observed by every practitioner. Only a large scale inquiry into sickness incidence could reveal that past conditions in the cotton mills have led to its being the cause of the disablement, permanent or temporary, of an excessive number of operatives engaged in the dustier processes of the mill. Whether the much improved modern conditions of work have removed this risk is a moot point which only time can solve. With constantly changing conditions of manufacture, and often a very slow development of disability, this is a further difficulty of investigation which is likely to be frequently encountered, and, as in this particular case, limits the final conclusions regarding the industrial risk.

A dust hazard that has for some years been agitating the anthracite section of the Miners' Federation, and has been the subject of repeated questions in the House of Commons,[3] is that involved in anthracite mining. Does anthracite dust inhaled in varying quantities over a working life have a damaging effect upon health? This is a problem which has, at the request of the Mines Department, been closely considered by the Medical Research Council's Committee on Industrial Pulmonary Disease.[4] The difficulty is to obtain a sufficient number of surface workers for medical examination, who have been exposed to anthracite dust *only*. The examination of underground workers, engaged in hewing the coal and conveying it to the surface, can unfortunately contribute nothing towards a solution, for these workers are not exposed only to anthracite dust but also to the stone dust produced in boring through rock and in roof "ripping." The development of a pneumoconiosis amongst these workers is therefore not necessarily the result of the inhalation of anthracite dust per se but may indicate a silica risk. This point is emphasised in a recent study of the "health of old and retired coal-miners in South Wales"[5] made (with financial assistance from the Medical Research Council) by Dr. ENID WILLIAMS, Cecil Prosser Research Scholar in Tuberculosis in the University of Wales, 1930–31. She points out that a man who has worked his whole life on the "screens" (where the coal is mechanically sorted on the surface into various grades) is the only colliery worker who has been exposed to coal dust alone. But such a man is rare, for a screener draws smaller wages than any of the skilled workers underground, and young and vigorous men do not seek the work. In fact, the screens are largely the resort of men who consider themselves unfit for work underground, or who having worked underground as hewers have failed on account of ill-health. "They are often men who are dyspnœic and have other signs of chest disease. They have asked for 'a job on top,' and have been put to work on the screens." Examination of such a selected group of operatives is not likely to lead to illuminating results. An alternative, and perhaps more hopeful line of approach, is being sought by the Medical Research Council's committees in information from "coal trimmers" occupied in loading coal at the docks.[6] These workers are exposed to various concentrations of coal dust in the hold of the ship, and with the complication of stone dust thus removed, may lead to a more decisive answer to the problem. In his study of the silica contents of lungs, published in our columns recently,[7] Dr. A. F. SLADDEN included four of these workers, and was led to the conclusion that coal dust alone, apart from silica, cannot be regarded as a cause of serious fibrosis of lungs. The result of more extensive investigation amongst the living will be awaited with interest; the problem is important, though, as Sir GEORGE NEWMAN points out

[1] Report No. 54. H.M. Stationery Office. 1929.
[2] Report No. 59. H.M. Stationery Office. 1930.
[3] THE LANCET, 1932, i., 430 and 1289; 1933, i., 1101.
[4] Report of the Medical Research Council, 1930–31, p. 123.
[5] University of Wales Press Board, 1933, pp. 108, 6s.
[6] Report of the Medical Research Council, 1931–32, p. 117.
[7] THE LANCET, July 15th, p. 123.

in his annual report for 1931, it does not follow that its immediate statistical study is a practical operation.

Meanwhile, within the limits she set herself, Dr. WILLIAMS gives a valuable picture of the retired miner. Starting from the observation that the incidence of death from "bronchitis" is very much higher in old coal-miners than in all occupied and retired males (reported in the Registrar-General's Occupational Mortality Supplements) she sought to discover the underlying pathological conditions, whether, for instance, some of these cases of bronchitis in miners were due to the result of old lung fibrosis due to a pneumonoconiosis, and others to a chronic and clinically latent tuberculosis. For this purpose she made an examination of a hundred old and retired miners, whose family and industrial histories she collected with great care and detail. The importance of the working history is fully apparent when it is noted that individuals have gravitated to mining from such employment as stone-quarrying and tin-mining with their known pulmonary risks. The family histories suggest an unduly high proportion of miners in whose families there was a history of tuberculosis in near relatives, and Dr. WILLIAMS believes that there is a higher degree of tuberculosis amongst the miners themselves than occupational mortality statistics indicate, but that the disease is present in a modified form and is most often clinically latent. Among the hundred men were 32 whom she believed on clinical evidence to have pneumoconiosis. In assessing these, stress was laid on great dyspnœa and diminished respiratory excursion, together with physical signs such as pleural friction or the presence of emphysema; radiological evidence was absent in all but a very few cases. A further 31 men were considered clinically probable cases of the disease, and 14 men clinically possible. Of the hundred men there were, therefore, only 23 who had, on clinical grounds, no evidence of the disability. It should be remembered, however, that only one of the hundred patients came to autopsy, and in him the post-mortem findings were not strictly in accordance with the clinical findings. It is important to note, moreover, that the high proportion of men showing clinical evidence of pneumoconiosis can be regarded as evidence of actual incidence only inferentially in conjunction with the high bronchitis death-rate of old coal-miners in general, for this sample of men was, without doubt, unrepresentative. It included 16 men who had retired from work on account of chest symptoms, and others, possibly, whose faces the general practitioners, who selected them, "saw oftenest in the surgery." To the solution of the particular problem of anthracite dust it can contribute nothing, for all the workers examined had been exposed to certain quantities of stone dust underground. As regards the more general dust risk of the miner in South Wales the findings are certainly suggestive and require close consideration, more especially, Dr. WILLIAMS suggests, as modern machine drilling may increase the amount of dust inhaled unless preventive measures keep abreast of mechanical development. At present we are still only on the fringe of these industrial pulmonary risks, and much remains to be done in their detection, their measurement, and their prevention.

AN ALTERNATIVE TO PHRENIC EVULSION

THE value of phrenic evulsion in the treatment of pulmonary tuberculosis is well established. Not only does the operation provide an alternative method when pleural symphysis prevents the establishment of an artificial pneumothorax, but in many cases of basal disease an adequate collapse of the diseased area may be secured by phrenicectomy alone, and the recurrent interventions and risks inseparable from other methods of collapse may be avoided. As an auxiliary to artificial pneumothorax, phrenic evulsion, by relaxing the tension of adhesions, will often effect the closure of cavities which would otherwise require the more serious operations of internal or external pneumolysis. It may be said indeed of this procedure, as of artificial pneumothorax treatment, that no one abandons it who has had experience of its results in judiciously selected cases.

The results of phrenic evulsion are, however, definitive; there can be no regeneration of a nerve so rudely treated; the paralysed diaphragm rises to a certain height and there remains. The objective may have been the closure of an apical cavity, and if this object is not attained—which in the treatment of apical disease is not unusual—the patient is worse off than he was before, for he has been deprived of the effective use of a lower lobe while retaining all the disadvantages of a diseased upper lobe. If an upper-lobe thoracoplasty or an apicolysis is now attempted the diseased area may be successfully collapsed, but the healthy areas of the compressed lower lobe will not regain their function. When a patient is suffering from bilateral disease, and phrenic evulsion is employed to bring a measure of rest to the side more seriously affected, it may succeed in its object, but at a later date progressive disease on the opposite side may threaten life, and it will then be too late to demand extra work from the healed lung, whose base remains permanently out of action. This is an embarrassment which does not arise when alternating or simultaneous bilateral pneumothorax is practised, for this method enables us to apportion the work of respiration between the two sides of the chest, and each lung remains to some extent under control. These difficulties associated with phrenic evulsion would be obviated, however, by a procedure which, while leaving the phrenic nerve intact, would temporarily inhibit its action, and such has been the aim of F. CORDEY and P. PHILARDEAU.[1] The phrenic nerve is exposed and isolated for at least 3 cm. of its course, the greatest care being taken to avoid traction or bruising of its tissue, and absolute alcohol is then injected drop by drop beneath the neurilemma until the nerve is rendered completely insensible. Any alcohol which escapes

[1] Rev. de la Tuberc., June 1933, p. 594.

into the surrounding tissues is diluted with serum or by injection of local anæsthetic. It is claimed that if 5 cm. of the nerve is treated in this way, and if *absolute* alcohol is employed, a paralysis of at least one year's duration may be confidently anticipated. Such a period might well suffice for the healing of a basal cavity or even of an area of disease remote from the base, and at the end of it, or a little later, the slow regaining of function by the diaphragm would prove beneficial rather than harmful.

CORDEY and PHILARDEAU do not refer to the difficulties encountered when an accessory phrenic assists in the innervation of the diaphragm. It was because of the frequency of this additional nerve-supply that the operation of phrenic evulsion was designed—an operation that has replaced the simple division of the nerve which often failed to achieve its object. Presumably the most careful nerve blockage would fail unless accessory branches were also dealt with, and a further operation would then be required. In this connexion it is important to note that phrenic evulsion following an alcohol injection may prove very difficult, for the tissues surrounding the nerve are apt to become thickened and opaque as the result of the previous treatment. The injection of a few drops of Chinese ink at the time of the original operation has been proposed as a means whereby the track of the nerve might be followed if further interference should be required.

FLUORINE AND FLUOROSIS

WITHIN the last ten years the serious nature of chronic fluorine poisoning has been recognised, and in reviewing the subject Dr. FLOYD DEEDS [1] is able to bring out several important facts connected with agriculture and food production which affect the public health. He states that a daily intake of 0·1 to 0·15 mg. of fluorine per kg. of body-weight is capable of producing at least one important manifestation of chronic poisoning—namely, mottled teeth, which occurs endemically in large areas of America, Africa, Asia, and Southern Europe.[2] "Therefore," he says, "the use of fluorine compounds, or of mixtures containing fluorine derivatives, as insecticides or fumigants in conjugation with plants or foods, should be limited to conditions where satisfactory removal of fluorine residues can be carried out before placing the food on the market." He suggests that chemical analyses for fluorine content should be made on a wide variety of foods and food products grown and prepared under conditions in which the fluorine content is acquired solely through natural processes, and on the basis of such analyses a tolerance limit for added fluorine should be specified. All will agree that further investigation of the physiological effects of fluorine, especially under conditions of continued administration or intake, is desirable.

Meanwhile V. GUDJONSSON has discovered a new hazard of modern industry—fluorosis of the bones and ligaments. Working with Prof. P. FLEMMING MØLLER in the occupational hygiene bureau of the Labour Inspectorate in Copenhagen, he was at first concerned with the incidence of silicosis among workers in dusty trades, and studied the conditions under which, near Copenhagen, cryolite is crushed and refined for use in the manufacture of aluminium. Cryolite is a fluoride of sodium and aluminium, containing as much as 54 per cent. of fluorine, and in the crude state it is mixed with a considerable amount of quartz. MØLLER and GUDJONSSON [3] chose 78 employees, all of whom had been engaged in work in a cryolite factory for more than two years, and they found four distinct lesions, each of occupational origin. (1) Pulmonary silicosis was present in various stages in half the subjects examined, the diagnosis being based on radiograms of the chest. The conclusion is unavoidable that the disease of the lungs was due to quartz-laden dust in the factory. (2) Changes, probably due to the deposition of calcium fluoride were found in the bones, ligaments, and muscular attachments. As radiographic investigation of the lungs proceeded, it was found that in 30 out of the 78 workers the shadows of the ribs, clavicles, and cervical vertebræ showed unusual density and abnormalities in the bone pattern. In typical radiograms the osseous pattern of the vertebræ is completely effaced and replaced by dense opaque shadows, and the transverse processes are covered by excrescences which represent calcification in ligaments. The shadows of the ribs show uniform increase of density, and there is pronounced calcification of the costal cartilages, though the articular cartilages are not affected. In the pelvis the pattern of the spongiosa is obliterated by dense opaque shadows resembling those seen in osteoplastic carcinomatosis, and along the periphery of the pelvic bones are blunt excrescences corresponding to calcified muscle attachments. None of these changes in the skeleton seems to have produced symptoms, but since chronic fluorine poisoning in animals leads to abnormal brittleness of the bones, one wonders whether these workers will sooner or later develop fractures. (3) A complete examination was made of the blood of all those workers in whom changes in the bones were found, and 14 out of 30 showed a reduction in the red cell count, the average figures being red blood-cells 3,700,000 per c.mm., colour-index 1·02, and hæmoglobin 77 per cent. No primitive red cells nor basophil stippling were discovered; the white cell count was normal, and the general health of the workers was apparently unaffected by the anæmia. (4) Nausea, loss of appetite, and vomiting was reported in 42 of the workers examined. These symptoms are supposedly due to slight corrosion of the mucous membrane of the stomach by hydrofluoric acid liberated from the swallowed dusts of cryolite, and they come on acutely soon after the dusty work is begun. Thus one of the principal managers of the industry, who visits the factory only occasionally, states that if he stays more than ten minutes in one of the places where the dust is particularly thick, he is obliged to get out into the open air in order not to be seized by vomiting. All

[1] Medicine (Baltimore), 1933, xii., 1.
[2] See THE LANCET, 1931, i., 982.
[3] Acta Radiologica, 1932, xiii., 269.

the symptoms go away as soon as the patient gets out into the open air, and after working hours no feeling of discomfort remains.

In this country so far workers in fluor-spar (calcium fluoride), enamel, and glass, have been found free from fluorosis of the bones in those cases in which the chest has been radiographed in the search for pneumoconiosis.

ANNOTATIONS

DOCTORS' HOBBIES

AN exhibition held in the anatomical school of Trinity College during the meeting of the British Medical Association in Dublin deserves special mention. Dr. F. S. Bourke had collected there for the amusement and instruction of the visitors what was described in the catalogue as a motley collection representing the diverse interests which from time to time have occupied the leisure of men when they relaxed from the arduous toils of an exacting profession. Being an artist and collector himself, Dr. Bourke was able effectively to comb the four provinces of Ireland in his search for material and to form an exhibit probably unique in the annals of the Association. "Here"—to quote from the very scholarly catalogue—"are trophies won on the hazardous field of war and in the clean conflict of sport, not least amongst them those of an Olympic athlete (Sean Lavan) who has brought honour alike to his country and to his profession. Here are antiquities from the prehistoric Irish elk to the rushlight that once shed its infant beam on Shannon's shore. Here is cunning of cast and sculpture, of work in metal and in wood, beauty of jewel and enamel, showing a craftsmanship as keen as any that has come from Tutankamen's tomb. Here is melody of measured word, reflect of our Irish bards of old." Hobbies, Dr. W. Doolin reminds us in a prologue, is an apt term for the collection, for the hobby was a small horse of Irish breed, trained to an easy gait, whose rider never need fear fatigue. For the majority of medical men compelled by the exigencies of service insensibly to work in an ever-narrowing groove, walking of evenings in the shadow of the clinic even after they have left it, the exhibition was a valuable object lesson in one of the best forms of release. There were in all 251 exhibits by 51 exhibitors, many of intrinsic interest: fishes such as an enormous Porbeagle shark caught off Achill Island last autumn or a trout caught on dry fly on two successive days; models of sailing boats; collections of useful articles made in leisure moments from old bits of scrap or used to while away the time in the trenches; and a surprising number of pleasing pictures in water colour, oil, pen or drypoint. The catalogue itself contains curious bits of information—e.g., that the song "Robin Adair" was written about a Dublin surgeon who left his country under distressful circumstances to become surgeon to Chelsea Hospital and later surgeon-general. The writer was Lady Caroline Keppel to whom Robert Adair was betrothed. And again, the reason why the remains of the Irish elk are nearly always of males is because the males on account of their huge antlers, could not swim and were easily drowned. The exhibition was visited throughout the meeting by a constant flow of members and their friends, to the pleasure of whose stay in Dublin it undoubtedly contributed in no small degree.

TESTS OF CIRCULATORY EFFICIENCY

MANY laboratory tests of circulatory function have been investigated; among others there are the determination of circulation-rate, circulating blood volume, oxygen content of venous and arterial blood, vital capacity, and oxygen consumption before and after exercise. A paper by G. Nylin [1] gives his results chiefly with the last named. He determined, before and at fixed times after graduated work (which consisted in walking on stairs), the oxygen consumption, minute volume of the heart, blood pressure and pulse-rate, both in normal people and those with various grades of heart disease. It was found that the increase in oxygen consumption after work, expressed as a percentage of the resting value, varies within fairly narrow limits in healthy persons, and is independent of body-weight, provided that the latter is within physiological limits. In patients with heart failure with congestion there is a consistently greater increase after work; in borderline cases of heart failure the increase is more doubtful and the figures overlap those given by normal people. Similarly, values for basal metabolism and minute volume obtained in failure cases at rest, and for increase in ventilation after work, are not reliable for diagnosis, since they partly overlap those for healthy subjects.

These results confirm the general view that in the diagnosis of circulatory inefficiency laboratory methods at present add little or nothing to clinical observation. Where heart failure is severe the clinical diagnosis is easy and can be made with certainty without further tests. It is in the early stages of circulatory failure where the clinical signs are equivocal or lacking that further tests are required for the interpretation of symptoms suggesting a possible cardiac origin, and unfortunately it is just in such cases that the methods reported fail in their aim.

MELIOIDOSIS

RECOGNISED as occurring sporadically in the Malay States and in Burma since 1912, melioidosis has of recent years been encountered elsewhere, and when the condition becomes more widely known and better methods for an early diagnosis are devised it is probable that the distribution will be found to be far wider than was hitherto imagined. In a publication [2] from the Institute of Medical Research of the Federated Malay States, Dr. A. T. Stanton and Dr. W. Fletcher have incorporated the bulk of their experience of this disease together with much of the work that has been done by other investigators. The disease occurs naturally in small animals as well as in man, rodents in particular being susceptible to natural infection. It has been assumed but not proved that rats constitute the normal reservoir of infection; few instances of melioidosis infection have in fact been found when large numbers of rats have been examined in plague surveys. Normally the disease appears as single isolated cases, but upon one occasion it occurred in true epizoötic form when heavy losses were encountered amongst small laboratory animals at Kuala Lampur. On this occasion infection was traced to the food-supply. The alimentary tract has been regarded as the normal portal of entry of infection—again on scanty experimental evidence. The causal organism named after Whitmore has been classified in the Pfeifferella group by Topley and

[1] Acta Med. Scand., 1933, Suppl. lii.

[2] Study No. 21: Melioidosis. London: John Bale, Sons and Danielsson, Ltd. 37 plates. Pp. 59.

Wilson on account of its close resemblance to *Pf. mallei*, the cause of glanders. Objections have been raised to this classification of *Pf. whitmori* because of its active carbohydrate fermentation and its motility. Carbohydrate fermentation, however, constitutes a difference of degree only, whilst the question of motility does not outweigh serological similarity and similarity of pathogenesis. As regards the latter point, both *Pf. mallei* and *Pf. whitmori* produce practically identical cellular reactions in the animal body. When the serology of the two organisms is studied some interesting and surprising points are revealed. In the first place the serological relationships of various strains of *Pf. mallei* are very indefinite: thus *Pf. mallei* (strain) Minett shows only a slight group relationship to *Pf. mallei* Java or Muktesar, and even less relationship to *Pf. whitmori*. *Pf. mallei* Java and Muktesar, on the other hand, are serologically identical with *Pf. whitmori*. This relationship is not, however, borne out by the pathogenicity of the organisms concerned, for all the *Pf. mallei* strains are highly infective to the equine species, whilst *Pf. whitmori* is only slightly infective to horses. It would appear that "H" agglutination cannot be demonstrated in *Pf. whitmori*, since various workers have designated this motile organism as serologically identical with strains of the non-motile *Pf. mallei*.

Since the disease runs a rapid course and is practically always fatal there is no time for antibody formation, and the diagnosis is generally only made at autopsy. Little is known of the value of allergic diagnostic tests or of the efficacy of antiserum for treatment. The chief problems to be faced in connexion with this disease are in the first place to devise rapid and practical methods of diagnosis so that the true distribution of the infection may be ascertained, and opportunity may arise for the investigation of curative procedures. Secondly, more information is required of the various combinations of circumstances necessary before infection takes place. *Pf. whitmori* is probably a common contaminant of food in certain parts of the world, and it survives a considerable time in unfavourable surroundings. That being so, full knowledge of the process of infection becomes very necessary if epidemics similar to the epizoötic outbreak at Kuala Lumpur are to be avoided.

OUR KNOWLEDGE OF ANIMAL NUTRITION

THE publication in America of "Clio Medica," a series of primers on the history of medicine, is a sign of the increasing interest now being taken in the evolution of the various branches of medical science. The latest addition to this series, of which ten volumes have already been published, deals with the history of nutrition.[1] It is a posthumous work of the late Dr. Graham Lusk and we are told in the preface that the preparation of it gave him great pleasure. This one can well believe for no one was better fitted than Lusk to describe the gradual growth of a subject to which he had devoted his life. He could say also that in contributing to that growth "pars magna fui" for he was, along with his fellow-countryman Atwater and with Rubner, one of the most distinguished pupils of Carl Voit, who, in turn, was a disciple of Liebig, the founder of modern nutritional physiology. It is fascinating to trace with Lusk the gradual increase of our knowledge of animal nutrition from its empirical beginnings down through the Middle Ages when progress was retarded by authority and by the influence of the humoral doctrines, until, with the birth of chemistry in the seventeenth century and the introduction of the experimental method, it began to become a real science. It was the work of the great German physiologists, Liebig, Voit, and Rubner, in the nineteenth century, however, that finally established the laws of quantitative metabolism and made the subject not only a science but a science almost as exact as mathematics. Rubner's enunciation of his "isodynamic law" and his subsequent demonstration that the principle of the conservation of energy holds good in mammalian physiology put the coping-stone on the edifice and it was only left for Atwater, Magnus-Levy, and Lusk himself (amongst others) to work out, with the aid of the respiration-calorimeter, the detailed application of the principles already established. In this little book Lusk only touches in one short chapter on the history of dietetics, but it would be an interesting task to show how our knowledge of food and its uses in health and disease has grown step by step with the growth of chemistry and physiology. Down to the beginning of the nineteenth century the word dietetics was still used in the old sense of "regimen of health," and we find Willich, in his lectures on Diet and Regimen (1800) defining it as "a systematic view of all objects relating to health in general and to food and drink in particular," whilst his treatment of the subject is really not so much in advance of the "Regimen Sanitatis" of the twelfth century or Tobias Venner's "Via Recta" of the seventeenth. By the middle of the nineteenth century, however, the influence of the work of the French and English chemists and of the German school of physiologists had made itself felt so that such a book, for example, as the late Dr. F. W. Pavy's "Treatise on Food and Diet" (1874) gives a presentation of the subject entirely modern in outlook and to which, on the quantitative side at least, later text-books have added nothing of moment. The demonstration of the importance of the qualitative side of dietetics and especially of the biological value of different proteins, of the vitamins and of the part played by the mineral constituents of food, has been the great contribution of the present century to the science of dietetics, but the growth of our knowledge of these matters it will be the task of some future devotee of Clio to record.

[1] Nutrition. By Graham Lusk. New York: Paul B. Hoeber. 1933. Pp. 142. $1.50.

FUMIGATED FOOD

THE fumigation of foodstuffs is a growing commercial practice employed to destroy vermin that for one reason or another constitute an economic loss. The destruction of various insects infesting foods is in itself an admirable object, but according to Dr. C. N. Williams, of the U.S. Public Health Service,[1] it has reached proportions that call for special notice of its possible effects on the public health. The principal fumigants used are hydrocyanic acid, cyanogen chloride, sulphur dioxide, carbon bisulphide, ethylene oxide, ethylene dichloride, and chloropicrin. All of these are gases or are easily vaporised, and all are more or less poisonous and are absorbed to some extent by the materials to be fumigated. The choice offered to the consumer is not a cheerful one. On the one hand, verminous food is unpleasant to think of, if it is not unwholesome to eat, and on the other, even the remote possibility of consuming poison gas adsorbed on the surface of food is not to be dismissed lightly. So far as hydrocyanic acid is concerned the danger seems not to be real with dry foods. Where the water content is high the position is more serious.

[1] Amer. Jour. Pub. Health, 1933, xxiii., 561.

The results of ad hoc experiments on small animals, and apparently of large scale experiments on the general public conducted in the ordinary course of commerce, led the Surgeon-General of the U.S. Public Health Service in 1930 to state "the bureau is not acquainted with any evidence of harm to human beings from the use of food products that have been treated by the cyanide method. . . It seems that the experience of many years, covering the use of this material, furnishes us with better evidence of harmlessness than would be secured by much experimental work." One may, however, shudder at the temerity of those who seem to have started the practice without "much experimental work." Dr. Williams, reviewing the facts up to the present, agrees with the Surgeon-General, saying that all data point to a similar conclusion as regards other fumigants than hydrocyanic acid. He considers one and only one regulation reasonably justifiable in control of the practice—namely, ventilation of the fumigated product for 24 hours, or until the fumigant is no longer detectable by taste or smell.

DEATH-RATE OF RETIRED MERCHANT SEAMEN

In a note on the recent blue book on "Statistics relating to Mortality in the Mercantile Marine" during the year 1929–30, which appeared in November last and was noticed in our columns (THE LANCET, 1932, ii., 1020), it was observed that deaths of merchant seamen seemed to be more numerous just as men were leaving the sea, for while 642 deaths occurred in that year among the 127,518 men at sea, the deaths of men ashore (i.e., unemployed or, as it may be said, retired) were in the first year after leaving the sea 625, in the second 155, and in the third 98. Not only so, but of the 625 who died in the first year after leaving, Major Edge reported 298 deaths in the first three months, 161 in the second three, 90 in the third, and 76 in the fourth period of three months after leaving the sea, the deaths being even more markedly numerous just after leaving the sea. No statement was made in his report as to the diseases causing this early mortality, and the time available for his investigation was short, but the question seemed to require elucidation. A request was accordingly submitted by Fleet-Surgeon W. E. Home to the Board of Trade that he should be allowed to examine the certificates (Form G.R. 109) reporting the 625 deaths which had occurred in the first year after leaving the sea. It was hoped to find out thus the causes of the deaths, and why they seemed so numerous just at a particular juncture. The President of the Board approved the idea, and the certificates were placed at Fleet-Surgeon Home's disposal so conveniently that the examination was made in two days. In reporting the result of his task to us, he says: "Though my inspection was obviously not so accurate as Major Edge's, and was not checked, my three-monthly figures were 312, 151, 95, and 64, while his were 298, 161, 90, and 76; thus the differences are not very great, and some light breaks through on the question. There were more deaths just after retirement, that is in the first three months, from pneumonia, tubercle, and cancer than in the active service or service afloat in a whole year. Even in so rapid an examination of the certificates it became obvious that some of these deaths ashore (or on the retired list) were deaths of men who had only been discharged from their ships when already sick, of men who had only become unemployed because taken ill or injured—i.e., had become unfit to go to sea—and had been discharged to hospital with a view to their replacement on board by other seamen. The youngest of the retired died at 18 from lymphosarcoma of the lung, the oldest at 80 from rheumatic fever. Several of the cases of cancer were in old men who had been, one thought, kept in their jobs for 'auld lang syne' until they had at last broken down seriously, and had then soon died in hospital. Besides those men who broke down while serving on ships, one cannot but think there must have been an even greater number who left their last ships as usual but were taken ill, and became unable even to apply for another." Fleet-Surgeon Home submitted to us a table showing the injuries and diseases from which retired seamen die and, quoting from the blue book, points out that we have in it statements now giving information that has never been made public before and for which all interested in the welfare of merchant seamen ought to be grateful.

THE CAROTID SINUS REFLEX

It has been known for many years that pressure on the carotid artery at the level of the cricoid cartilage will slow the heart beat, but it was not until 1923 that H. E. Hering discovered the carotid sinus. This observation set going a great number of experiments and investigations which have upset established doctrine. In 1927, for example, he was able to show that the response was due to a reflex, and not (as was thought) to direct stimulation of the vagus nerve, and that this reflex originates in the wall of the sinus of the internal carotid artery near its junction with the external carotid artery.

It has been proved experimentally that an increase in the pressure in the carotid sinus will diminish the flow of blood in the coronary arteries; yet D. Danielopolu (1929) has reported one case and S. Wassermann (1928) six cases in which pressure on the sinus relieved anginal pain. They explained this effect on the basis of special reflexes. Recently E. J. Wayne and L. B. Laplace,[1] working in the department of clinical research at University College Hospital medical school, have studied the effect of such pressure on nine patients suffering from angina of effort. They found that in all these patients when pressure was applied to the carotid sinus the duration of the pain decreased and there was a more rapid fall of blood pressure and pulse-rate than in the control tests. They think that the relief is due to a diminished energy expenditure of the heart, caused primarily by a diminished heart-rate with or without a diminished blood pressure. This diminution of energy more than outweighs the effect which pressure on the sinus might have in constricting the diseased coronary vessels.

It has often been noticed that in disease of the heart or vessels an exaggerated carotid sinus response is obtained on slight pressure, and this has been thought to be a simple and therefore valuable diagnostic sign of chronic myocardial disorder. With this in mind, Louis H. Sigler [2] has examined the reflex in 345 cases, which he divided into five groups, as follows: (1) arterio-sclerotic heart disease; (2) hypertension and hypertensive heart disease; (3) rheumatic heart disease; (4) neurocirculatory asthenia; and (5) general constitutional disease. Investigating first the effect of pressure on these various cases, he found that slowing of the heart was much more marked in the arterio-sclerotic and hypertensive groups; next in order came the rheumatic group; while the smallest degree of slowing was shown in those with neuro-

[1] Clinical Science (incorporating Heart), 1933, vol. i., No. 1, p. 103. (This new journal is edited by Sir Thomas Lewis, F.R.S., from University College Hospital medical school, London, W.C. 1.)

[2] Amer. Jour. Med. Sci., July, 1933, p. 110.

circulatory asthenia. In all groups females showed definitely less slowing than males. Sigler came to the conclusion that for an effective response it was necessary to have a "vagotonic predisposition," which was found more commonly in males and less commonly in cases of neurocirculatory asthenia; he further found that local disease tended greatly to accentuate the reflex. In a further investigation he set out to discover whether age, heart-rate, and variations in rhythm have any bearing on the carotid sinus reflex. So far as his observation goes the reflex is seldom seen in adolescence, grows commoner during adult life, and reaches a peak in middle age (41–60). Where there was much bradycardia no further vagal slowing was obtained, and in cases of moderate bradycardia the response was greatly diminished; there was no appreciable difference in response between sinus arrhythmia and normal sinus rhythm, except in arterio-sclerotic heart disease. His final investigation was concerned with the effect of carotid sinus pressure in cases with precordial pain as compared with those without precordial pain. In this he was working on the assumption that since increased vagal tone with its efferent vasoconstrictor effect on the coronary system may be at least partly responsible for angina in the presence of coronary sclerosis, a heightened carotid sinus reflex response, indicating increased vagal lability, should frequently accompany such pain. The cases showing precordial pain as a symptom were separated from each of the five groups, and their response to carotid sinus pressure was compared with the response given by those without precordial pain in each group. It was found that in all the groups except the patients with rheumatic heart disease, the response in cases with precordial pain was greater than in those without it.

HALLUX RIGIDUS

THE cardinal symptom of hallux rigidus is a progressive, more or less painful, limitation of dorsiflexion at the metatarso-phalangeal joint of the great toe. It is apt to develop soon after puberty, and according to most observers is more common in women than in men. In a recent paper [1] J. P. Strombeck discusses the causation of this condition and its relation to other deformities of the foot. In a series of 23 cases, 20 were females, and 12 of these were under 20 years of age. There is sometimes a history of trauma, such as stubbing of the great toe. Subjectively, there is pain on walking and other exercises requiring dorsiflexion of the great toe. There may be periods of exacerbation followed by partial remission of pain. The foot is typically of a long narrow form, in contrast with the spreading foot characteristic of hallux valgus. Flat-foot of the abduction type is common in association with hallux rigidus, but is not necessarily a forerunner of it. Several authors have associated the rigidity with an abnormally long great toe. This occurred in one case in the present series, and was due to increased length of the basal phalanx. Another anatomical peculiarity which has often been noted is abnormal length of the first metatarsal. In this series of cases, Nilsonne's index (which signifies whether the distal end of the first metatarsal oversteps or falls short of a line drawn tangential to the head of the second metatarsal and at right angles to its long axis) was positive in 48 per cent., as against 29 per cent. in 138 normal controls. But as the author himself points out, his figures are too small to be of much statistical value. Radiographically, the most marked features of the cases are a comparatively wide and flattened metatarsal head and changes typical of arthritis deformans, more marked the older the patient. The author suggests that the arthritis is primary, and that the contracture of the short flexor muscles and plantar ligaments which causes the deformity is a secondary complication. He points out that similar arthritic changes may be found in the opposite great toe, in unilateral cases, despite the absence of symptoms. The arthritic changes may be caused by functional overstrain, predisposing factors being the long slender foot with comparatively long great toe, and the wide flat metatarsal head already described. Strombeck compares the condition with Köhler's disease of the second metatarsal, and points out that several cases have been reported of both lesions in the same foot. He ascribes the relative frequency in females to a lesser degree of resistance to strain of their organs of locomotion. He hardly touches upon the question of shoes.

[1] Acta Chirurg. Scand., 1933, lxxiii., 53.

OUTDOOR SHELTERS IN LONDON PARKS

A CORRESPONDENT, who was for 17 years hon. secretary of a children's care committee, writes to complain that there is in the London parks hardly such a thing as an outdoor shelter where one can sit free from wind and damp. The need of convalescence in seaside or country would, she writes, be partly met if there were means for the invalid poor of getting five or six hours of daily rest in the open air, free from the danger of catching cold. She admits that some of the parks have small shelters for refuge from showers, but she has visited every large park in London without finding one shelter protecting from wind and damp, such as are to be found in any large seaside resort, and she asks us to use our influence in inducing the authorities to erect two or three such shelters in each of the large parks. With the exception of Highgate Wood, which is the concern of the corporation of London, the principal parks and open spaces in the metropolitan area are maintained either by the Crown or by the London County Council. In the Royal Parks, which cover some 2000 acres, a year or two ago the Commissioners of Works were stirred to beneficent activity, which resulted among other things in the opening during the summer of the Serpentine Lido and the provision of additional seats in sheltered places. The open spaces under the control of the L.C.C. are far more numerous and cover more than 5000 acres, and on the Council as paramount public health authority rests the responsibility for the prevention and treatment of disease by healthy environment. While we recognise what has been done by open-air schools and various kinds of playgrounds to give full value of sun and air to the younger citizens, we agree with our correspondent that the convalescent, and others in search of rest, may still seek in vain for it in the open air. We commend her desire to the attention of the parks committee of the L.C.C.

THE LATE PROF. GREENISH

THE influence of a man such as Henry George Greenish, who died in London on August 2nd, goes beyond that of his printed books and his spoken words. His "Text Book of Pharmacognosy," now in its sixth edition and already a classic, is typical of his method as a teacher. It gives in a few lines the salient characteristics of each article of materia medica, with the requisite amount of detail worked in afterwards in such a way as to sustain the interest

of the student; and it is not overburdened with unwanted or occasionally wanted information. As might have been expected, the author of a scheme of instruction so soundly planned turned out some good students. But the help he was always ready to offer in the solution of problems brought to him from the outer world was perhaps his most characteristic contribution to pharmacognosy and the sciences allied to it. Endowed with a personality shrewd but not complex, no one left him without the satisfaction of having the problem, whatever it was, either solved or at least posed, set in its true relation to whatever else might be relevant. And his influence may be traced in the recently effected recognition of the Pharmaceutical Society's college as a constituent college of the University of London. It may be surmised that, as dean of the college, he had to persuade some, at all events, of the council of 21 elected members, forming the Society's administrative body, of the advantages to be secured by incorporation in a university representing authoritative standards in education, general as well as specialised. Whatever changes may occur in the administration of medicine and treatment, Greenish's work will remain a landmark.

BARBITURATE SKIN LESIONS

DRUG eruptions are no longer among the rarities of dermatology, and with the increasing use of new synthetic preparations the practitioner must always be on the look-out for them. Those due to barbiturates are important, not only because these drugs are often prescribed, or taken without prescription, but also because intolerance to them is relatively common. The rashes may be erythematous, scarlatiniform, rubeolar or morbilliform, urticarial, miliary or bullous, erysipelatous, or of a type resembling the lichen urticatus of children. Some help in the differential diagnosis from these "acute specifics" is usually given by the absence of associated fever, but in a case of acute erythema due to veronal, reported in our columns a year ago by Dr. W. H. Gregory[1] the patient had a temperature of 103° F. The list of lesions is so long and varied that a diagnosis at sight is seldom made, even by the most experienced, but mistakes which may well have serious consequences would nevertheless be made but rarely if the possibility were not forgotten. A type of reaction that will be new to most readers is that described by F. Coste and M. Bolgert.[2] It appears to follow or coincide with the state of coma or deep sleep induced by the drug—e.g., veronal—and is a bullous or ulcerative lesion seen as a rule over the sites of pressure like an acute bedsore, which it may resemble in other respects too. Two cases are described. The first patient, a nursing sister, had taken 3·75 g. of a proprietary preparation containing veronal. She remained semi-comatose, with most reflexes abolished, for six days, and on regaining consciousness was found to have an ulcer about 4 in. in circumference on the left buttock. Her Wassermann reaction was positive, and the possibility of a local cause such as a bismuth injection having been excluded, a lesion in the spinal cord was tentatively considered. This explanation, however, was thought unlikely, especially as the cerebro-spinal fluid was normal. The ulcer healed in two months. The second case was that of a woman of 24 who took 4·3 g. of gardenal, another barbitone derivative. She was comatose for 48 hours only, but developed bullæ containing serous fluid on both soles. Necrosis supervened, and as the lesions were not due to hot-bottle burns it was arguable that the gardenal was to blame. About ten days later a scarlatiniform eruption appeared suddenly over the whole body, gradually becoming eczematous in some areas and urticarial in others. The ulceration on the soles healed eventually as in the first case. In seeking to explain the pathology Coste and Bolgert briefly discuss the possibilities of central or peripheral trophic disturbance, and a combination of the effects of prolonged local pressure and sepsis from the dejecta in a comatose subject. The abolition of defensive reflexes would support such a view, but the proof would require animal experiment.

[1] THE LANCET, 1932, ii., 110.
[2] Bull. et mém. Soc. méd. hôp. de Paris, 1933, xlix., 779.

Dr. Willem Storm van Leeuwen, who died at Leiden on July 30th, held a professorial chair as director of the University Therapeutical Institute there. His name is familiar in connexion with the causation and treatment of the allergic group of diseases, especially bronchial asthma and urticaria. At one time he regarded the use of tuberculin as the most valuable form of non-specific treatment in such cases, but later on, in an address to the Royal Society of Medicine, he ascribed his failure to achieve more than 50 per cent. of cures to the fact that climatic factors played such an important part in their causation, and he was led to study what he called the climatic allergens, with a view to eliminating his patients from contact with them in their homes. In pure cases of climatic allergy he regarded the allergen-proof chamber as the principal means of treatment. Such chambers were installed in a number of private houses, with the result that asthmatics were able to sleep in their chamber at night without attack, in the daytime going about their work. The chambers and the clinical results obtained with them were described in THE LANCET (1927, i., 1287).

OWING to the resignation of Sir Arthur Keith, the office of conservator of the museum and director of research of the Royal College of Surgeons of England is now vacant. Application for this appointment should be made in proper form before Oct. 7th.

Application is also invited for the Milroy lectureship for 1935 of the Royal College of Physicians of London. Announcements about both these appointments will be found in our advertisement columns this week.

LIVERPOOL CITY HOSPITALS: ANNUAL REPORT.—The report for 1932 of the Liverpool City Hospitals and Institutions calls attention to the greatly increased work done during the year as represented by 4093 more patients in the transferred institutions, and 596 patients in the sanatoria and isolation hospitals. Notwithstanding this increase there was a reduction of 301 in the number of deaths. By an increased turnover of beds and a "remarkable advance" in the work as continuation departments, involving 68,598 attendances by out-patients, a maximum use of the beds had been made and large economies effected. Additional accommodation has been provided for the maternity services. Blood-serum obtained from persons who had previously suffered from infection had been used in the children's hospital as a means of preventing the spread of measles. Surgical operations increased from 4513 in 1928 to 7191 in 1932, and a second theatre has been provided at the Walton Hospital. In all the transferred hospitals there is insufficient accommodation for nurses, but arrangements have been made to cope with it, and for the Smithdown-road Institution plans for the accommodation of 164 nurses, at a cost of £16,000, await the sanction of the city council.

SPECIAL ARTICLES

LEAD POISONING IN THE NORTH-EAST OF SCOTLAND

BY

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THE investigation reported in this paper, which embraces chemical analysis for lead of water-supplies, urines and fæces, and clinical and hæmatological examination of many persons, was undertaken as a result of information derived from three cases of lead poisoning admitted to the wards of Aberdeen Royal Infirmary, under Prof. Davidson. It is proposed, therefore, to deal with these cases individually as an introduction to the report submitted.

Three Cases

CASE 1.—Mrs. A., aged 42, admitted on March 3rd, 1931. As this case has been described in detail in a paper dealing with macrocytic hæmolytic anæmia [1] only a summary need be given here.

Previous history.—Patient had had attacks of abdominal pain periodically for many years. The pain had little relation to food, but was at times sufficiently severe to make her sick. The bowels were constipated; there was no history of epistaxis, hæmatemesis, or colic.

Present illness.—About one month previous to admission her doctor reported that she had symptoms of influenza with severe abdominal pain and sickness.

Examination.—The patient was a well-nourished woman with a mild degree of jaundice. Physical examination of all systems was negative except for tenderness in the right hypochondrium over the gall-bladder and liver. Urine: trace of albumin and sugar present; casts absent; bile absent; urobilinogen present. Blood count: red blood-cells, 2·5 million; hæmoglobin, 55 per cent.; colour-index, 1·1; white blood-cells (including nucleated red blood-cells), 7000; reticulocytes, 5 per cent.; icterus index, 33; van den Bergh indirect reaction, positive. Price-Jones curve typical of pernicious anæmia.

Despite treatment with liver extract and ventriculin the blood level failed to rise, although at times the reticulocyte percentage count reached 25. A stationary blood count with high reticulocyte counts indicated that a hæmolytic anæmia was present, and when free hydrochloric acid was found in the gastric juice the diagnosis of pernicious anæmia was discarded. During the next six weeks the patient had many attacks of abdominal pain; jaundice became more marked and, in addition, mental changes and convulsions occurred. The patient gradually improved and went home, but returned to the ward within four weeks, extremely ill, and suffering from the same symptoms as already described. Eventually she was removed to the Royal Mental Hospital, Aberdeen, suffering from acute confusional insanity. After six weeks' treatment she steadily improved, and was discharged on Oct. 3rd, 1931. On Jan. 25th, 1932, her doctor requested that she should be readmitted to Aberdeen Royal Infirmary, and stated that after remaining well for several weeks persistent epigastric pain and vomiting occurred. Physical examination again failed to reveal anything to account for the symptoms, and the blood count was: red blood-cells, 2·5 million; hæmoglobin, 45 per cent.; colour-index, 0·9; reticulocytes, 2 per cent. Marked punctate basophilia (*for the first time*) was found to be present.

The possibility that lead was the unsuspected toxic agent was immediately considered, and the patient was cross-examined with regard to the water-supply of her house. At first lead contamination appeared to be ruled out, since the patient stated that she lived in a cottage in the country and the water for the house was drawn from a well, no water cistern existing in the cottage. Fortunately, cross-examination was continued and the information elicited that the water was carried by a lead pipe from the well, which was 400 yards distant, and pumped by hand when required. It was therefore obvious that the water would lie for long periods in the pipe, which would act as a lead cistern. A sample of fæces was submitted to analysis and found to contain 6·6 mg. of lead per 100 g. dried fæces. Two samples of water from the pipe were examined and showed 1·7 and 2·1 parts of lead per 100,000 of water. A diagnosis of lead poisoning was made, and the discovery of the toxic agent made perfectly plain the symptoms which had so long baffled us. It is difficult to know how a correct diagnosis in the early stages could have been made, since no peripheral neuritis was present, there was no blue line on the gums the patient being edentulous, and the blood picture was absolutely atypical.

CASE 2.—Miss B., aged 18, admitted on May 30th, 1932. For many months the patient had been feeling easily tired. Five weeks before admission she was suddenly seized with severe pain in the upper abdomen, which doubled her up and at times radiated to the right iliac fossa. The pain appeared to have no relation to food. Vomiting was frequent and severe. The bowels were regular previous to the onset of the pain, but since then constipation had been present. A diagnosis of appendicitis was made by her family doctor and the patient was transferred to the surgical wards, under the charge of Mr. F. K. Smith.

Physical examination.—Apart from abdominal tenderness on palpation nothing abnormal was found in any situation, and the patient was transferred to the wards under the charge of Prof. Davidson. Blood count: red blood-cells, 2·8 million; hæmoglobin, 45 per cent.; white cells, 6600. Examination of a stained film revealed many red cells with punctate basophilia. There was no blue line on the gums and no wrist-drop. Examination of the fæces on May 26th, 1932, showed 5 mg. of lead per 100 g. dried fæces to be present, and on three other occasions positive tests were reported. A diagnosis of lead poisoning was accordingly made and the water-supply investigated. This showed that 0·22 part of lead per 100,000 was present.

Inquiry with regard to the other members of the household revealed the following facts: In January, 1931, the patient's grandfather suffered from severe abdominal pain and colic. He was admitted to a nursing-home, where examination was negative, and he accordingly returned home. In 14 days the pains returned and he was readmitted to the nursing-home, where he was operated on for appendicitis. Nothing abnormal was found. He returned home, and after a month colic again appeared and grew progressively worse. The patient died on July 15th, 1932. An uncle and two maids in the house had all suffered from constipation and severe abdominal colics. There can be no doubt whatsoever that five of the inmates of this household suffered from lead poisoning.

CASE 3.—Mr. C., aged 56, admitted on July 6th, 1931, complaining of constipation and pain in the abdomen.

Physical examination revealed slight jaundice and severe anæmia, a blue line was found on the gums, and punctate basophilia was present in the blood film. The water-supply

of his dwelling was investigated and found to contain 1·5 parts of lead per 100,000 of water. A diagnosis of lead poisoning was accordingly made. He became acutely confused and disorientated, and was transferred to the Royal Mental Hospital, Aberdeen. After some months he was discharged, having apparently made a good recovery. Information obtained from his doctor shows that he died at home some months later.

Examination of the water-supplies of the houses of these three patients elicited the following information: In every case there was an absence of lead cisterns and pipes in the house, and the source of the drinking water was at a considerable distance and was brought to the vicinity of the house in lead pipes. It was obvious, therefore, that the lead contamination of the water, proved by chemical assay, occurred during the period in which the water was in contact with the lead pipe, particularly at night when no water was being pumped. Since it seemed not unreasonable to suppose that this type of water-supply might be of frequent occurrence in country districts, it was decided to approach the medical officer of health with a view to undertaking a large-scale investigation.

Method of Investigation

Areas were mapped out and particular attention was paid to water-supplies which were conducted to the dwellings by lead pipes from sources at a distance. Samples of water were obtained and submitted for analysis to Mr. Charles Wilson, B.Sc., working under the direction of Mr. Alexander B. Weir, city analyst. In most cases where the lead content was found to be above the accepted limits of safety, a clinical and hæmatological investigation

TABLE I.—*Lead Content of 160 Water-supplies* * *(parts per 100,000)*

—	Less than 0·05	0·05–0·1	0·1–0·25	0·25–0·5	0·5–1·0	1–1·5	Greater than 1·5	Total.
W.S.	52	38	36	22	5	5	2	160

W.S. = Number of water-supplies.
* In cases where the water-supply has been analysed at different times during the day the lead content of the earliest sample is taken.

of the individuals in such dwellings, together with a quantitative estimation of lead in their urines and fæces, was carried out. Table I. shows the lead content in the water-supplies of 160 dwellings.

CLINICAL

One hundred and two persons were questioned with regard to constipation, colic, muscular weakness, and examination of the gums was made for the presence of a blue line. In addition a blood film was taken, and if obvious anæmia was present a full blood count was done. Of 102 persons examined 51 (50 per cent.) had symptoms that might be attributed to lead poisoning. Constipation and abdominal pain of some degree were by far the commonest symptoms complained of, but it is difficult to know how much weight to lay on such symptoms per se as evidence of lead poisoning. No definite blue line on the gums was discovered, but a large proportion of the adults were edentulous. Undoubted wrist drop was present in only two cases.

HÆMATOLOGICAL

Prolonged staining with Leishman's stain was the method used for the demonstration of punctate basophilia. Other methylene-blue stains[2,3] were tried, but full staining with Leishman was found to be a simple and satisfactory proceeding. Moreover, the absence of punctate basophilia from hundreds of blood films stained in this way, from cases attending the blood clinic in Aberdeen, served as a control in regard to the rarity of punctate basophilia, except where the degree of anæmia was severe. The test was considered negative when no cells showing punctate basophilia were encountered in a five-minutes' search. If from 1 to 5 such cells were found in five minutes the result was considered mild, 5 to 10 cells moderate, and 10 + severe. Of 59 persons examined 26 (44 per cent.) showed no punctate basophilia, 18 (30·5 per cent.) a mild degree, 9 (15·2 per cent.) a moderate degree, and 6 (10 per cent.) a severe degree. Of 42 hæmoglobin estimations 16 showed some degree of anæmia—i.e., less than 85 per cent. hæmoglobin. It would be unwise to draw any deductions as to whether lead was the cause of this anæmia, as most of the cases (10) occurred in women of the childbearing age [4] and the anæmias of severest degree were not in general associated with marked punctate basophilia.

Table II. shows the amounts of lead found in 53 samples of urine and 27 of fæces. Table III. shows lead estimations in the urines and fæces of 20 persons

TABLE II.—*Lead Content of Urines and Fæces of 80 persons*

URINES: mg. lead per litre.	Less than 0·1	0·1–0·2	0·2–0·5	Over 0·5	—	Total.
Cases	4	24	23	2	—	53
FÆCES: mg. lead per 100 g. dried fæces.	**Less than 5**	**5–10**	**10–25**	**25–50**	**Over 50**	**—**
Cases	2	7	11	5	2	27

TABLE III.—*Lead Content of Urine and Fæces of 20 persons resident in Aberdeen*

URINES: mg. lead per litre.

0·06	0·06	0·07	0·09	0·04	0·08	0·07	0·09	0·07	0·06	Aver. 0·069

FÆCES: mg. lead per 100 g. dried fæces.

2·44	5·2	3·5	5·5	6·7	4·5	4·1	5·7	3·4	3·9	Aver. 4·5

in the city of Aberdeen. The average amount of lead in the urines was 0·069 mg. per litre and in fæces 4·5 mg. of lead per 100 grammes dried weight. These figures agree with those of Kehoe and Thamann,[5] and it is generally accepted that the upper limit of normality is 0·1 mg. of lead per litre of urine, and 5 mg. of lead per 100 grammes dried fæces. Table II. makes it clear that excessive amounts of lead were being ingested, since 92·6 per cent. of fæces examined contained amounts of lead greater than normal. That excessive amounts were also being absorbed is indicated by the fact that 92·5 per cent. of urines contained pathological quantities of lead. The urines and fæces analysed were not obtained solely from persons drinking heavily contaminated water, but represented indiscriminate sampling of the whole group.

Methods of Prevention

There are at least three methods by which lead contamination might be obviated: (1) The simplest and cheapest method would be to pump, and, in

gravity-fed supplies, to run the water for a certain time, thus removing in whole or in part the water which had lain in contact with the pipe over night. (2) Should this method fail, liming the water by passing it through lime chips would cause a reduced absorption of lead, consequent on decreased plumbo-solvency of the water, and also by depositing an insoluble layer on the interior of the pipe. (3) Lastly, should (1) and (2) fail the question of replacement of the lead pipes by iron pipes would need to be considered.

TABLE IV.—*Effect of Running the Water on the Lead Content*

I.—WATER WITHDRAWN FOR ORDINARY HOUSEHOLD PURPOSES

—	Parts per 100,000.		
Early morning sample	0·10	0·53	1·4
Midday sample ..	0·03	0·17	1·3
Result	Successful.	Partly successful.	Unsuccessful.

II.—WATER RUN CONTINUOUSLY FOR 10 MINUTES

—	Parts per 100,000.		
Sample before running	0·11	0·64	1·38
Sample after running	0·02	0·17	1·22
Result	Successful.	Partly successful.	Unsuccessful.

The first method was investigated in two ways. In 68 water-supplies analyses were made of an early morning and a midday sample, taken after the water had been used for ordinary household purposes.

In 25 cases both samples contained less than 0·05 part of lead per 100,000 of water. The first sample in the remaining 43 cases showed a lead content of more than 0·05. This was reduced in the second sample to less than 0·05 in 22 cases, to between 0·05 and 0·1 in 8 cases, to between 0·1 and 0·2 in 5 cases, and was still greater than 0·2 in 8 cases. In 110 houses the water was run continuously for five to ten minutes and analyses carried out of a sample taken before and after. In 20 cases both samples contained less than 0·05 part of lead, while the first sample in the remaining 90 cases contained more than 0·05 part of lead. This was reduced in the second sample to less than 0·05 in 34 cases, to between 0·05 and 0·1 in 22 cases, to between 0·1 and 0·2 in 19 cases, and was still greater than 0·2 in 15 cases.

Typical examples of these cases are shown in Table IV. It was concluded from the investigation into 178 water-supplies that in 45 households the supply was already satisfactory while in a further 56 cases (42 per cent.) the simple procedure of running the water for a few minutes reduced the lead content to what may be considered a safety level. In 30 other cases (23 per cent.) in which the lead content was lowered to between 0·05 and 0·1, additional time spent in withdrawing the water might possibly have resulted in a satisfactory water-supply. In 47 cases (35 per cent.), however, this object could not be attained by this method. It should be mentioned that to obtain satisfactory results the householder must conscientiously and regularly undertake the emptying of the pipes before using the water for household purposes. Not every individual can be relied upon to carry this out. Moreover, in dry seasons when water is scarce, an additional difficulty presents itself. An analysis of the cause of success or failure by this method showed that several factors were concerned in this problem. A comparison of the degree of lead contamination with the distance of the source of water from the house, soon established the fact that the length of the lead pipe was an important factor in causing contamination of the water-supply. When from any mechanical inefficiency the rate of flow was reduced, the lead content of the water was found to be particularly high, and in such households running the water for a limited time failed to reduce the lead content to safety limits. Investigations of the plumbo-solvent property of water were carried out by placing three 3-inch lengths of ½-inch lead piping in 500 c.cm. of the water in a beaker for about 12 hours. Table V. shows that the plumbo-solvency must be considered to be a factor of importance, since in general there was a parallelism between the lead content of the water and its plumbo-solvent properties.

TABLE V.—*Indicates the Relation between the Length of the Lead Pipe, the Plumbo-solvent Property of the Water, and the Degree of Lead Contamination Present*

—	Parts per 100,000.																	
Lead content of first sample	0·4	0·49	0·40	0·01	0·02	0	0·02	0·01	0·01	0·6	1·07	0·88	0·57	1·6	0·56	0·53	0·44	1·10
Plumbo-solvency..	0·82	0·75	0·45	0·08	0·14	0·10	0·08	0·11	0·10	0·21	1·1	0·52	0·27	0·59	0·37	0·21	0·12	0·75
Length of lead pipe (yards)	80	20	100	300	30	0	250	P*	P*	250	200	50	400	300	1	15	300	500

P = Lead pipes present only within the house.

Discussion

The remarkable improvement in purity of the water-supplies of the great cities within recent years has apparently eliminated drinking water as a cause of plumbism, if the views expressed in a recently published book on public health are accepted. Robertson [6] states: "The occurrence of lead poisoning as a result of drinking water is now more or less of historical interest." Accordingly, in areas where no industrial occupations involving lead are proceeding, it is not surprising that the presence of lead poisoning may be overlooked. The fact that in the past two years we have had four severe cases in our wards, and know of four others, indicates the advisability of keeping it in mind.

The standard of safety for lead in drinking water is somewhat difficult to establish, as judged by the literature [7 8] and the opinions of leading authorities [9] in this country whom we have consulted. All are agreed, however, that a quantity of lead greater than 0·05 parts per 100,000 in the drinking water is undesirable. It will therefore come as a surprise to many public health authorities to hear that no fewer than 108 out of 160 water-supplies were above this safety level; further, that the lead was being absorbed in dangerous quantities is clearly shown by the figures given for lead in urines and the results of blood examinations. Nevertheless it must be admitted that the great majority of the persons

examined were not suffering from any of the major manifestations of lead poisoning. The problem therefore arises whether the dangers of drinking water with a lead content greater than 0·05 part per 100,000 have not been exaggerated. Since two of our patients have died and others have been seriously ill, preventive medicine demands that such risks should not be allowed to continue. The important part played by idiosyncrasy in the disease, and the well-known fact that muscular paralysis is liable to occur when a person becomes debilitated from illness or muscular exertion makes it apparent that at any time an individual excreting excessive amounts of lead in the urine may develop definite signs of plumbism. It is of some interest in connexion with lead idiosyncrasy to consider whether any relationship can be found between the lead content of water, the excretion of lead, the degree of punctate basophilia, and the presence of symptoms. From a study of our figures we were unable to show any close parallelism between punctate basophilia and the degree of contamination of the water or the amount of lead excreted in the urine. The average lead content of the water-supplies of the cases presenting symptoms that might be attributed to plumbism was only slightly higher than that of the cases presenting no such symptoms (0·54 as compared with 0·42 part per 100,000). The amount of lead in the fæces were definitely higher (average 46·2 mg. per 100 grammes dried fæces) in cases with heavily contaminated water (average 0·47 part per 100,000) than in cases of slightly contaminated water (average of 7·62 mg. per 100 grammes for water-supplies averaging 0·20 part per 100,000). While such a result is to be expected the degree of absorption of the lead ingested is a variable factor, as shown by a consideration of the urinary excretion of lead. Of the 28 cases whose urinary excretion of lead was less than 0·2 mg. per litre, the average amount of lead in the water-supplies was 0·44 part per 100,000. The cases excreting more than 0·2 mg. per litre of urine had water-supplies containing on an average 0·50 part per 100,000, or practically the same as the first group. In the production of the symptoms of lead poisoning factors affecting the mobilisation of lead from the bones must be considered, as well as those affecting its absorption.

In view of the unexpected results of this investigation it will be advisable for medical officers of health in other parts of the country to investigate water-supplies of the type described. We shall be surprised if similar results are not obtained. Support of this contention is forthcoming from a small investigation just completed in an area 50 miles distant from the district considered in this paper. In 12 out of 49 water-supplies the lead content was greater than 0·05 part per 100,000 and in several cases was very high.

Conclusions

Consequent on certain severe cases of plumbism being admitted to Aberdeen Royal Infirmary, an investigation was carried out into the types of water-supply, the plumbo-solvency of the water, and the lead content. A clinical and hæmatological investigation of the individuals using the water, and a quantitative chemical investigation of their urines and fæces for lead were made. (1) The drinking water was found to have a lead content beyond the safety limit of 0·05 part per 100,000 in 108 houses out of 160. (2) Quantitative investigation for lead in the urines and fæces of 80 persons showed excessive amounts in 74 cases. (3) Hæmatological investigation: punctate basophilia was found in 33 cases out of 59. (4) Clinical examination: 8 persons were found to be suffering from severe plumbism, and 51 out of 102 had symptoms suggestive of it in a mild degree. (5) Certain measures to eliminate the contamination of these water-supplies are discussed.

Our thanks are due to Mr. E. W. Conchie, sanitary inspector, county of Kincardineshire, for his coöperation and help in this investigation; and also to the Medical Research Council for a grant in connexion with part of the expenses incurred.

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THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

THE following appointments are notified: Surg. Comdrs. T. J. O'Riordan to *Vivid* for R.N. Hosp., Plymouth, and J. F. M. Campbell to *Resolution*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Sub-Lt. P. E. F. Routley to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. J. R. Lloyd retires on retd. pay.

Lt. (on prob.) G. L. McLeod is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.

Lts. J. Beggs and R. St. J. Lyburn resign their commns.

TERRITORIAL ARMY

Lt. E. J. B. Sewell to be Capt.

ROYAL AIR FORCE

Flight Lt. R. H. Stanbridge is promoted to the rank of Squadron Leader.

INDIAN MEDICAL SERVICE

The undermentioned appts. are made:—To be Lts. (on prob.): F. W. Allinson, F. R. Cawthorn, F. V. Stonham, J. F. J. Doyle, J. M. Matthew, W. B. Stiver, and J. J. Barton.

Capt. D. J. Young resigns his commn.

DEATHS IN THE SERVICES

Lt.-Col. George Waters, I.M.S., retd., who died at his residence, Lorrenden Lodge, Beddington-lane, Croydon, on July 25th in his 88th year, was a native of Caithness. He was educated at Thurso Academy and at Anderson College, Glasgow, qualifying with the L.R.C.P., L.R.C.S. Edin. in 1869. He immediately joined the Bombay Medical Service and in the following year served in the military department and acted as ophthalmic surgeon. Later he became civil surgeon at Bushire in the Persian Gulf. In 1877 he was appointed surgeon to the Governor of Bombay, and a few years later served as physician and registrar to the Jamsetji Jijibhoy Hospital and professor of pathology at the Grant Medical College, Bombay. He was presidency surgeon to the third district in 1889 and retired in 1901.

PANEL AND CONTRACT PRACTICE

THE COMING OF AGE OF THE NATIONAL HEALTH INSURANCE SCHEME

A RETROSPECT

By G. F. McCleary, M.D.

To the younger generation of practitioners the coming of age of the National Health Insurance scheme, which was celebrated on July 17th by a luncheon with Mr. Lloyd George as principal guest (THE LANCET, July 22nd, p. 205), may seem nothing more than a special anniversary of an institution whose existence and smooth working are taken as a matter of course. Such practitioners may only with difficulty imagine a time when there were no panel patients, and no insurance committees. But to the older generation, those who were in practice during the eventful years 1911–12, the birthday celebration recalls a time of heated controversy and direful foreboding. The scheme began its voyage on stormy seas. Mr. Lloyd George at the luncheon meeting likened its beginning to the rounding of Cape Horn—"very chilly winds ahead, heavy seas, and dangerous rocks ready to tear their craft"—and then, "sailing the Pacific Ocean." The scheme was indeed a bold undertaking. Compulsory health insurance in this country did not begin gradually as in Germany, where it was first introduced. The German scheme originally applied to not more than 10 per cent. of the total population. In Great Britain the persons who 21 years ago became compulsorily insured against sickness and invalidity formed no less than one-third of the total population. Compulsory insurance introduced important, and, as many feared, irritating changes into the social life of the country. Weekly contributions were required not only from the insured persons but also from their employers; and the obligation to insure was placed primarily upon the employer, who was made responsible for the payment of his insured employees' contributions as well as his own. Since the scheme provided medical treatment for many millions of insured persons it needed many thousands of medical practitioners to work it, and German experience had shown that there might be considerable difficulty in securing the willing coöperation of the medical profession. It is perhaps more evident now than it was 21 years ago that the launching of the health insurance scheme was an adventure which might well have daunted a pilot less intrepid and far-sighted than he who was then at the helm.

The National Insurance Bill was introduced into the House of Commons by Mr. Lloyd George on May 4th, 1911. It made an opportune appearance, for the report of the Poor Law Commission, which was published two years previously, had shown the need for doing something on a large scale for the wage-earners of the country in time of sickness. The Bill in its main principles found general acceptance. It was read a second time without a division, and even in the committee stage it had a comparatively smooth passage, considering the extraordinary range, variety, and complexity of its provisions. The result was a great parliamentary triumph for Mr. Lloyd George, who in dealing with doubters and objectors both in and out of Parliament displayed remarkable powers of exposition, persuasion, and conciliation. He had the competent assistance of the late Mr. Charles Masterman who, backed by the most resourceful of private secretaries—now world-famous as Sir Arthur Salter—was never at a loss in dealing with an interminable series of insidious Parliamentary questions. At the third reading the Opposition moved an amendment to postpone the further consideration of the health insurance part of the Bill until the next session, but it was rejected by a large majority, and the Bill received the Royal assent on Dec. 16th, 1911. The health insurance scheme, however, became more unpopular in the year after the passing of the Insurance Act—i.e., the year before the benefits, except sanatorium benefit, began. Its provisions were misunderstood and frequently misrepresented. Some part of the disfavour with which it was regarded was due to the inclusion of domestic servants among the persons to whom compulsory insurance applied. This provision brought home to the mistress of the house that she would be obliged to stick stamps on the contribution cards of her household staff, and a campaign was started against "stamp-licking," emanating from a class of society which at that time displayed a childish animosity against the author of the scheme. Fortunately the administration was in capable hands. Sir Robert Morant, the chairman of the English Insurance Commission, was a man of immense ability, driving power, and resource, and he gathered round him some of the ablest of the younger civil servants—indeed, it may be doubted whether any building has housed a more brilliant band of administrators than the converted hotel in Buckingham Gate which formed the early headquarters of the Insurance Commission. And then upon the scheme which had begun to work in an unfavourable atmosphere fell the catastrophe of the war, seriously depleting the panels by the demands for medical officers for the armed forces and putting a stop to the development of medical benefit which was planned in the spring of 1914. At that time an extension of the insurance medical service by the addition of a complete system of specialist, nursing, and laboratory services was worked out, when the necessary money was voted by Parliament; but with the outbreak of war the money was required for other purposes, and the insurance medical service has to this day remained in its original form as a service of general practitioners only—a result which was not anticipated 21 years ago, and cannot be regarded as satisfactory, especially in view of the wide range of treatment given by the continental insurance schemes.

During the passage of the scheme through the House of Commons Mr. Lloyd George accepted amendments that modified in some important respects the arrangements to be made for providing medical services. It was at first proposed that the approved societies should administer medical benefit as well as the cash benefits of the scheme. The proposal was strongly resisted by the British Medical Association, at whose instance medical benefit was placed in the hands of new local bodies, the insurance committees, upon which the local medical profession was represented. This step marked an important stage in the development of health insurance, for it was the first practical expression of the modern tendency, which steadily grows stronger, to separate the cash benefit side of health insurance from the provision of medical treatment. The doctors pressed for further concessions. They contended that the intimate and confidential relation of doctor and patient which obtains in private practice should be

secured unimpaired in insurance practice, and that this necessarily involved giving every insured person the right to choose and, if need be, change his doctor. And in order to give the widest possible field of choice, and also to secure that the panel doctors should not form a class separate from the general body of the profession, they maintained that every qualified medical practitioner should have a statutory right to undertake the treatment of insured persons if he wished to do so. The doctors pressed also for the representation of the profession on the insurance commissions and the local insurance committees, and for the creation in every county and county borough of a local medical committee charged with important administrative functions. These and other demands were conceded, and it is chiefly because of the concessions that the medical provisions of the scheme have, apart from some initial friction, worked smoothly and with general good will, and without the embittered disputes between doctors and insurance societies, such as have impeded the progress of health insurance in some continental countries. The scheme works on a gigantic scale. Every six months the 15,000,000 insured persons in England and Wales send in to their approved societies their contribution cards, which are examined, the stamps on each card counted, and the total value of the stamps credited to the appropriate society. Every year the 15,000 doctors write about 55,000,000 prescriptions. Each ingredient of an insurance prescription is priced, and the total cost of the prescription ascertained so that the 10,000 insurance pharmacists may each receive his due remuneration. The small weekly sums paid in sickness and disablement benefits make up in the aggregate an annual sum of about £15,750,000, and the amounts spent annually in medical benefit, maternity benefit, and the additional benefits are about £9,250,000, £1,590,000, and £3,000,000 respectively. That a system so vast and so intricate in detail should work so smoothly is a striking tribute to the good sense and good temper as well as the administrative capacity of the British people.

What has the scheme done? In the first place it has given the insured persons, upon whose labour the economic existence of the nation depends, some measure of security in times of sickness. The weekly payments of sickness and disablement benefits have brought money into the home when most urgently needed to keep the home together, and by thus mitigating the anxiety of the patient and his family have made for early recovery. The money paid out in maternity benefit enables provision to be made at a critical time for mother and child, although maternity benefit might with advantage be extended to include the provision of midwifery and medical attendance as well as a cash payment. The medical service side of the scheme is perhaps still more important. Every insured person is provided with a family doctor of his own choice, whom he may consult at any time without the payment of a fee, or without, as in some continental schemes, first having to obtain the written permission of his insurance society. The insured persons make full use of their facilities to obtain medical advice, and it is well that they should, for though most of the ailments for which they consult their doctors may be unimportant, many are the incipient and insidious signs of serious disease. Medical benefit in thus facilitating the early detection of disease has important preventive aspects, and dental benefit, on which over £2,000,000 are spent annually, is another influence making for the prevention of disease. The scheme successfully passed the ordeal of a critical examination by the Royal Commission on National Health Insurance. The commission found that "medical benefit has proved in practice a successful and most valued factor in the advancement of the health of the nation," and they were satisfied that the scheme had fully justified itself and had on the whole been successful in operation. They concluded that "National Health Insurance has now become a permanent feature in the social life of this country, and should be continued on its present compulsory and contributory basis." The scheme is not free from serious defects. Its extent of medical benefit is limited to a general practitioner service, and it provides no treatment at all for the dependents of the insured persons. In both these respects it compares unfavourably with the continental health insurance schemes, most of which make available for the insured persons and their dependents the full range of modern therapeutics. But few will dispute that it has been a good thing for the country, and those over whom the Minister of Health presided at the birthday gathering on July 17th did well to celebrate the attainment of the majority of British National Health Insurance and to do honour to its father.

"Commercially Minded" or Shackled by Regulations

TRIBUTE was recently paid by the Minister of Health to the way the profession is working the Act, but it cannot be denied that there is dissatisfaction in some quarters with the terms of service. An instance of how the panel doctor is being shackled by regulations was reported last month to the London insurance committee.

A girl, alone in a flat, injured her ankle, and being in pain she rang up her doctor asking him to come. There is then a discrepancy in the evidence. The girl said she gave her address; the doctor said she did not. As the doctor did not arrive, instead of calling him on the telephone again, she sent for another doctor and complained to the committee. In the meantime the doctor looked up the girl's record card to get her address and drove to the last address on the card, taking someone with him in his car who corroborated all that happened. Here the girl was not known, so, as the doctor said, "I came back home expecting to hear again." Yet for this action he had to appear before the medical service subcommittee to defend a charge of not going to an urgent case when called.

This doctor was in due course acquitted, but little wonder if after such experience he endeavours at least to obtain for himself all his just dues and, in the words of Mr. Macquisten, becomes "commercially minded." Here is another way in which the doctor suffers under the regulations. A patient ceases to be insured; the record card is asked for and sent in. Subsequently he again becomes eligible for medical benefit. He is sent a new medical card with no doctor's name on it, but as he has still the old medical card with his doctor's name on it he does nothing with the new one and thinks he is still on his old doctor's list, whereas he is not on anyone's list. But until the old doctor is called to attend him the doctor is at risk for this patient, often for quite a long period, and is receiving no pay beyond his share of unallocated people which is divided between all doctors every year.

There are of course many duties laid on panel doctors—inspections by regional medical officers, reports on tuberculous cases, reports on referred cases—which do not occur in private practice and may lead to resentment. Perhaps the most flagrant injustice

relates to Clause 7 (III) of the terms of service. Under this an insured person can deliberately demand private treatment from a doctor, receive his medicines privately, have them sent to him for any length of time, but if within one month from paying the bill (or receiving an account) he claims that he was insured the insurance committee have power to make the doctor withdraw his account or refund the money paid, allowing him temporary resident payment for the case, about 13*s*. It is stated there is no appeal from the decision on such a case made by the medical benefit subcommittee or a section of it. The doctor is allowed payment for drugs on the tariff scale, but will be out of pocket over such things as containers, which may mount up during a long attendance. There is a feeling that where an amount ordered to be withdrawn or refunded is considerable (say £1) the case should be referred to a tribunal on which are an equal number of laymen and doctors with an independent chairman.

Yet another way in which doctors are had has been discovered by the organising secretary for London. Not very infrequently prescriptions are altered after they have left the doctor's surgery by having additional quantities added—e.g., x may be placed in front of ii making 12 ounces instead of 2. His drug account, by these means unfairly increased, may lead to inquiry by the regional medical officer.

CORRESPONDENCE

PEDIGREE-KEEPING

To the Editor of THE LANCET

SIR,—A communication from the correspondent of the *Times* in Berlin, published in the issue for July 31st last, informs us that a State Office for racial affairs, opened under the Nazi régime in Thuringia, offers free advice to those about to marry. The advice tendered is based, among other things, upon data concerning disease and the racial structure of the family. To this end information is sought in respect of all relatives and kinsfolk of the Thuringian man or maid, back to their 32 great great grandparents. And this not only about the descendants of these, but also about husbands and wives of descendants. Thus, there would appear to be involved, as the correspondent says, "the collection of remote information concerning some scores of people for each applicant." Offices for giving advice on marriage had already been available for some years in German-speaking lands when Wagner-Jauregg wrote an article on the subject in the *Wiener Klin. Woch.* (Jan. 2nd, 1931), but the number had by then scarcely increased. To establish advisory offices in advance of an efficiently working, proved scheme for keeping family pedigrees of health and disease, defect and abnormality, upon which advice could be based, appears illogical. It is obvious that advice could now and again be given without such records in some chance instance with glaring recent history of disease. For such a special bureau is scarcely needed. For the rest, long years of pedigree-keeping must pass, and would-be advisers must be trained in their subject before advisory offices can profitably be opened and eugenic marriages made in Thuringia or elsewhere. But if the régime is purposeful and forceful, if mass action is feasible, the principle can be recognised and a sound pedigree-scheme produced and put into operation with that satisfying swiftness that impresses. This would place Thuringia and other regions under the same rulers years ahead of those countries where candles are lit and prayers offered for the souls of these rulers. Every man his pedigree schedule and a uniform schedule for every man.

Can one be in his right mind and believe this feasible, or is the defender of such a thesis of necessity a case for care under compulsion, without the option of the blessed provisions of the Early Mental Treatment Act? Assuredly, men have been "signed up" for less. Taking this risk, I have been fashioning such a document; to serve not only the eager nubile, but as a basis for the study of genetics as applied to medicine, and to enable us in time to give rational advice on the chances of inheritance of disease, defect, and abnormality. For this purpose I have taken as a basis the cheaper and less elaborate of two pedigree schedules issued by the Eugenics Society at 6*d*. The other, permanent one, costs about 10*s*. 6*d*. I have adopted from this what seems desirable. These schedules are not intended for the general purpose I have in view, but to encourage people to keep their pedigrees, and more particularly to keep a record of some particular defect in the family in which they may be interested. I have to thank Dr. C. P. Blacker, of the Eugenics Society, for giving me copies of the schedules, which constitute a most helpful basis. Naturally, the consent of the Eugenics Society would be necessary before any use could be made of a modification of them. The one adopted by me deals, briefly, with symbols used in preparing a chart, pedigree reference numbers, the description of an attached specimen pedigree (cataract), general instructions; and a ruled blank chart is supplied for keeping the pedigree. My purpose is, by modifications and additions to the schedule, to show that a chart can be kept by anyone, which shall indicate by symbols not only the usual points, such as sex, miscarriage, infantile deaths, twins, unknown siblings, but also shall by symbols show whether individuals charted are healthy, diseased, defective, or abnormal, or carriers of disease, &c.; or that no information about an individual is available. For particular ascendants, relatives by marriage, collaterals, whose ancestry it is desired to record, a separate chart or charts are employed, whereby confusing elaboration is avoided. For each individual on the chart there is an individual case-sheet, with a reference number corresponding to that on the chart. Answers are to be given to appropriate questions on this; and disease, defect, &c., indicated by the chart symbol is to be specified and described on this. A specimen family pedigree is given, illustrating the symbols, including those for health, disease, and defect (common diseases and defects have been chosen to correspond to these latter). This pedigree chart shows descendants to the generation of the compiler's children and ascendants to the great grand parental generation, space being left for more remote ascendants. The point of durability of material used in making this schedule can probably only be met by admitting that we must be content with such durability as a charge of about 2*s*. will cover. Individuals interested will find means of providing durable covers.

This pedigree is to be kept with the help of the family's medical adviser. I am told that people may object to this "intrusion." I have told myself that many practitioners will need training and experience before they can adequately advise. Then

there is the objection to recording certain diseases; there are, it is not surprising, many hypothetical objections. And there are the fearful and faint-hearted, who would "leave it to the State," the Holy Mother Church and Refuge of Socialism. I am all for the State, which has made possible our rate-supported charming retreats for visionaries, unhappily pedigree-less for want of instruction. But in Thuringia it has been left to the eugenically minded Nazi régime, which I conceive as hurling maledictions at those who have wasted time by failing to provide a common pedigree schedule. Meeting my critics armed with hypothetical objections with no less assumption, I shall maintain that "here and now" there are masses of educated people in various strata of society who would show interest in this matter of pedigree-keeping, and would obtain a schedule, if those members of the medical profession who have experience in the subject, banded in this or that appropriate association, would get together, produce a practical schedule, and start a movement, having for its ultimate object the keeping of family pedigrees on the grand scale.

I am, Sir, yours faithfully,

Hove, August 4th, 1933. EDWIN GOODALL.

THE FUTURE OF MEDICAL PRACTICE

To the Editor of THE LANCET

SIR,—I have read with interest Dr. Brock's letter in your issue of July 29th. He has stressed the necessity for the practitioner becoming more capable, and I would like to draw attention to the need for the acquisition of increased facilities for the exercise of his skill. This can be assured by the same methods as are adopted in business enterprises and in hospitals—specialisation, organisation, and coöperation. Specialisation is above all desirable for those branches of medicine and surgery which require particular apparatus—e.g., microscopes, instruments for illuminating or treating areas ordinarily inaccessible (bladder, bronchi, fundus of the eye, ear, and nose). Organisation is necessary to avoid waste of time by providing a clerical staff to keep records and make appointments. Coöperation is advisable that special organs more or less out of reach of direct examination should be treated by those devoting themselves to acquiring the special skill needed. Patients should have access to them in the early and curable stage of disease rather than when secondary changes have developed.

Medical men in private practice have hardly yet given sufficient attention to methods of combining and coöperating to give more efficient service. When they do the standard of treatment among the community as a whole will be raised. The public glimpse the necessity of these things by their preference for going to hospital for treatment of many common ailments. They know the departments of hospitals as well as the hospitals which specialise in the areas in which they feel they suffer. We read frequently of the practice which slips away from the general practitioner. It is not due to want of brains that this occurs, but rather to want of facilities for giving treatment.

No ordinary doctor can stand the expense of providing equipment and accommodation as well as the clerical and nursing assistance to give the various forms of physical treatment—baths, light, electricity, manipulation, &c.—necessary for quick recovery from affections following acute diseases and injuries which are met with in general practice. These could readily be treated early by practitioners combining to establish "centres," "clinics," or "medical houses" where these would be available. The attitude of the profession in many instances is individualist and exclusive, and patients often do not recover as quickly and completely as they might do if the treatment were early and more efficient. We have much to learn from the methods of successful business enterprises.

I am, Sir, yours faithfully,

Devonshire-place, W., August 2nd, 1933. A. R. FRIEL.

To the Editor of THE LANCET

SIR,—Much has been written and is being written on the outlook of medicine in the near future, for everyone can see that the magnificent progress of science is not represented in practice. The medical profession retains its aspirations if served by men as fine in their ideals as were their predecessors, but practical factors militate against the work and the opportunities of too many of those who make of medicine a professional career. It is nothing to be surprised at that many desire a State medical service, nor that a large section of the public hold that the institution of such a service would solve many difficulties.

The medical is the most expensive and scientifically expansive profession for a young man to enter upon, and its excessive nerve strain with heavy expenditure lasts throughout the doctor's career. Sixty years ago a four years' medical curriculum was required to gain a diploma to practise physic, and when this was obtained the portals of instruction automatically closed behind the successful candidate, who then as a rule went out into the world to practise what he had learned during his curriculum; and out in the world he often sold his services for what he could get to obtain such experience as would be forthcoming under such awkward circumstances in an endeavour to compete with others who already held the field against him, and to win the goodwill and confidence of the public in order to secure a livelihood.

This spirit of competition and rivalry for bare subsistence fostered a spirit of emulation and jealousy amongst doctors that, whilst it may have sharpened their wits, occasioned ill-feeling and, it is to be feared, sometimes subversive measures to win over and keep wealthy patients; and, whilst such influences blurred the fineness of the doctor's work, it blighted its conduct and effects amongst the patients, though they were probably ignorant of the undercurrent of ill-will caused through the ever-present struggle for existence. Although acquaintances, a community of doctors could not be honestly friendly in an atmosphere of distrust occasioned by their circumstances; and these things did an injustice to the ideals of the profession, as well as being detrimental to the public interests.

Now much of this is changed. The medical curriculum is lengthened and the manner and methods of instruction are improved, whilst the accumulation of knowledge acquired by the profession itself, as well as by the laity, has made great alterations in the work of doctors as well as in the circumstances of its conduct. Now when a man becomes qualified and registered as a doctor he is called upon to move forward with the times, to continue to study new theories, to practise fresh methods, and, in fact, to continue his curriculum as a medical student all his days, with some provision for instruction now being made for him to do so.

This is all quite right and proper—the health and lives of the people are their most valuable possession,

and must command the best service available—but, on the other hand, the men who are expected to fulfil the arduous conditions now necessitated need more detailed consideration than they have so far received. It is not right that a clever and popular physician should be overburdened with duties that may perchance be satisfactorily transferred to a less prominent person; nor that the livelihood of a good and capable man shall lie at the disposal of a fickle and non-discriminating public. It cannot be right for one who has spent all his time and fortune in getting qualified to be driven to his wits' end to provide the necessaries of life, nor forced to envy and begrudge the hard-work earnings of his "opposition practitioner," who in his turn is struggling with force of circumstances and his own difficulties. It is impossible for anyone to do the best he can for others when he is distraught in himself with his own troubles and importunate worries.

Every young man possessed of the requisite strength of mind and body, and the means to take up the study and practice of the stern and relentless medical profession with all its ever-present obligatory and self-sacrificing responsibilities, needs the financial and whole moral support of the people for whose benefit he must willingly and unflinchingly devote his life and attention. This end has evidently been aimed at and partly attained by the introduction of the "National Health Insurance" scheme that has already gone far to put doctors upon a better footing with their poorer patients and medical service more within reach of the poor; but in these days of "progress" this is not enough, nor does it purify the spring of philanthropy (contaminated by competition) sufficiently to meet the call of the times. That call is for a "State medical service" to provide for and carry out in careful detail the vastly increased requirements of modern days.

To do his work properly the doctor of to-day must be relieved of his own financial anxieties and worries, together with much of the responsibility of his professional work to which great anxiety is frequently attached; and at the same time the public must be relieved of the selection of arrangements for the conduct and management of matters they cannot fully comprehend. The doctor's stipend should be secured to him with the duties assigned to him in accordance with his training and capabilities, and in this way—"as on military lines"—an efficient and effective force for public medical service may be supplied to the whole country probably for a smaller sum than is at present paid in petty details of unknown, unrecognised, and often ill-requiting amounts.

I know that the question of a State medical service has been much discussed, and I know also the difficulties inherent in instituting it. Those difficulties, I presume, have been held insuperable, as advocacy of the revolution has ceased. But meantime the difficulties of practice remain, and indeed seem aggravated. Lord Dawson's remarks at Bristol, reported in your columns recently, were apt and opportune. Alterations are made and amendments introduced, often with benefit, but sometimes these only temporise and complicate much that must be finally deleted, in the same way as monetary liabilities deferred eventually compel increased efforts to defray. The "medical tree" is already overweighted by its branches. The centralisation of a supreme supervising authority with radiating powers for control and distribution is called for—a reorganisation of the whole profession, i.e., 'A State medical service."

I am not alone in wishing to have the advantages of a State medical service kept before the profession.

I am, Sir, yours faithfully,

Chaceley, Gloucester, August 1st, 1933. J. GOOD.

THE ROYAL SOCIETY DISCUSSION ON "EXPERIMENTAL PRODUCTION OF MALIGNANT TUMOURS"

To the Editor of THE LANCET

SIR,—Reading Mr. Lockhart-Mummery's letter in to-day's issue of THE LANCET one would infer that the experiments to which he alludes form the exclusive occupation of the Imperial Cancer Research Fund in particular, and that the director of that Fund poses as an autocratic critic on all questions of cancer. The real situation bears no resemblance to this assumption. The latest report of that Fund was regarded in America—where I happened to be on its publication—as being the latest and most trustworthy and suggestive exposition of the cancer problem at that time.

Turning to the question of experiments on birds, animals, and plants—where would be any of the public bodies and lonely workers if these formed no part in the investigations? After all these experiments and observations are clinical records that bear immediately upon the human disease. I do not take the view of Mr. Lockhart-Mummery that there is a tendency on the part of any of these public bodies and lonely workers "for experimentalists to get out of touch with the surgeons and pathologists who are dealing with the disease in human beings." I would be more inclined to take the view that "surgeons and pathologists" are not sufficiently in touch with the experiments and observations upon birds, animals, and plants. They have been of the greatest assistance to me, and Dr. Cuthbert Dukes has also discovered their aid.

All workers, whether connected with public bodies or working as independent units, like myself, have their eyes glued always on the relation between experiments and human disease. Otherwise their work would be deceiving the public that subscribes so liberally to all kinds of funds. Because some of us fail to detect striking allusions in the reports of these funds to our own particular hypotheses does not prove that they are not under the direct scrutiny and sympathetic study of all workers with whom I have come in contact during my travels. They are not disregarded by any worker I have met.

The problem is an international one, and in spite of this fact, we do not know, as Dr. Begg says—"Just how it is that a normal cell is changed into a malignant one."

I am, Sir, yours faithfully,

G. LENTHAL CHEATLE.

Harley-street, W., August 5th, 1933.

LACTIC ACID AS A FACTOR IN RHEUMATISM

To the Editor of THE LANCET

SIR,—I have read Dr. Drury Pennington's letter in your issue of July 29th with great interest, as the problem of lactic acid in association with rheumatic complaints has occupied my close attention during the recent year. It has been possible for me to examine a number of cases of rheumatism undergoing treatment at the Seamen's Hospital, Greenwich, and the Woolwich Red Cross Clinic for Rheumatism. Amongst other biochemical constituents of sweat following vapour-bath treatment, as practised by Dr. Charles Sundell, the percentage of lactic acid

present was determined both in rheumatic and non-rheumatic subjects.

My biochemical findings have shown me that there is no abnormal elimination of lactic acid by the skin in rheumatic patients over and above that which is found in normal individuals, thus corroborating the conclusions come to by American observers. The undoubted benefits derived from vapour-bath treatment may well be due to the increased oxidation consequent on the stimulus to the general metabolism, but there is no evidence that elimination of lactic acid by the sweat is the determining factor.

I am, Sir, yours faithfully,

EILEEN A. BOYD.

Devonport Pathological Laboratories, Seamen's Hospital, Greenwich, S.E., August 2nd, 1933.

PROBLEMS OF SPINAL ANÆSTHESIA

To the Editor of THE LANCET

SIR,—A complete agreement with Prof. Pannett with regard to the motive which provokes us to discuss these problems leads me to offer him some criticism of the experiment upon which he forms a basis for rather sweeping conclusions. The cranial dura mater is closely applied to the skull but the spinal dura is not so immediately supported by its bony canal. The brain and its large arteries pulsate in response to the cardiac pulse inside a rigid box and expansion necessitates a compensating expulsion of fluid from the skull—blood by venous channels and cerebro-spinal fluid through the foramen magnum. Contraction similarly requires compensating influx of fluid. There is thus at the foramen magnum an oscillation of cerebro-spinal fluid which gives rise to the spinal pulse, which is projected down the theca and gives a visible pulsation to the tube. This pulse as well as that of respiration is to be seen recorded on the spinal manometer. The increase of pressure is applied uniformly in every direction to the thecal wall.

Prof. Pannett has, I contend, confused cause and effect; the extradural tissue pulsates in response to the pulsation of the theca, for how could the low extradural pressure impose much effect on the higher intradural? In his rubber tube experiment the pulsation is applied laterally in such a way as to cause a deformation of the tube from its original cross-section, a type of change never found in the body, and this tube becomes therefore merely a laboratory mixing machine in which the behaviour of the methylene-blue might have been predicted without any great strain on the imagination. Moreover the tube is straight and horizontal, and has no inclinations corresponding to those in the body, and he offers no evidence that pulsations can drag a heavy fluid up hill or a light one down hill, which is what concerns us in clinical administration. His conclusions therefore appear to be based on faulty laboratory experiment, while everyday experiment in the operating theatre suggests that gravity plays a controlling part in clinical administration.

Prolonged subarachnoid splanchnic block is now easy to obtain by anyone who will take a big syringe and inject an appropriate volume of fluid up the spine, observing the same precautions with regard to dosage and concentration which have been accepted practice in all local infiltration work for many years. The real problem before us is the valuation of the method in relation to other forms and combinations of anæsthesia.

I am, Sir, yours faithfully,

London, W., August 5th, 1933. W. HOWARD JONES.

THE COMPLAINT OF THE FAMILY DOCTOR

To the Editor of THE LANCET

SIR,—In an article entitled The Family Doctor Must Wake Up! which appeared in the *Evening News* of August 1st, Dr. Alfred Cox states that hospital out-patient rooms are being flooded by the patients of "inefficient" doctors and those who treat their panel patients with "indifference." Such an accusation, made by a man who so recently held the responsible post of secretary to the British Medical Association, will carry much weight with the general public; yet there is scarcely a statement of his that cannot be refuted.

His theme is the outcome of a discussion at the recent representative meeting of the B.M.A. at Dublin, when the inroads made upon private practice by hospital contributory schemes were being considered and fears were expressed that, unless some counter-measures were adopted, the general practitioner would, financially, lose heavily. Dr. Cox pooh-poohs the whole idea and cites the profession's survival of the national health insurance scheme, the formation of clinics, welfare centres, and so forth as if to prove that no loss to the general practitioner resulted. Except in the case of health insurance he has undoubtedly lost, and lost heavily. And as to health insurance the capitation fee has steadily declined while the work has as steadily increased.

Now the hospitals are touting for and advertising their contributory schemes. Small wonder that the practitioner is worried by the prospect of a further loss to his income. Dr. Cox tells the practitioner that if he does his work "properly" he will not lose his patients. A public medical service will cater for the needs of the poor. Compare the two offers: that of the hospital contributory scheme and that of a public medical service. The former offers to its subscribers beds, nursing, X ray, out-patient treatment, and laboratory investigations gratis; *and* can and does advertise them. The practitioner can only offer his own good services with a bottle of medicine thrown in. Only an idiot would think the latter the better insurance!

The general practitioner is up against a serious position and certainly does not need the broadcasting of such an article as that of Dr. Cox to help push him down. Practitioners are asking themselves why such an article should have been written at all. The original discussion was one of a "family" affair between doctor and doctor. The public are not usually interested in our pecuniary embarrassments—that has long been evident.

I am, Sir, yours faithfully,

CYRIL SHERRIS, M.B., B.S.

Cheshunt, Herts, August 4th, 1933.

*** In the article to which reference is made Dr. Cox is considering the reasons why hospitals intended for accidents, emergencies, and serious cases are largely frequented by chronic cases and by people suffering from simple ailments. For this state of affairs he blames impartially certain types of hospital, insurance doctor, and insured patient. The hospital which is proud of the growing number of out-patients instead of regarding it as a reflection on organising capacity. The doctor, an undue proportion of whose insured patients are found to be attending as out-patients. The patient who in spite of his "free choice of doctor" never gets properly examined. The passage in the article from which our correspondent quotes runs as follows:

"As for those insured persons who go because they are dissatisfied with the indifference shown to them by

their insurance doctor, the profession has a clear duty. The insurance doctor whose patients in numbers exceeding the average are found to be attending as out-patients should be asked to show cause. This could be done by collaboration between the hospital and the panel committee.

"The patients of the *real* doctor, the man who takes his profession seriously, are not the people who flood the out-patient department. And the public must take its share of the blame. I often ask myself whether it was worth all the trouble the B.M.A. took to get 'free choice of doctor' when I hear of people who never get a proper examination from their doctor meekly submitting to it instead of getting another man who *is* prepared to do honest work for his money. *It is a lamentable fact that some of the most inefficient doctors have large panels, and that changes of doctor are comparatively rare.*"

BOARDING-OUT FACILITIES FOR THE LESS AFFLUENT

To the Editor of THE LANCET

SIR,—Both the Central and District Offices of this Society receive a large number of inquiries from members of the medical profession in regard to institutions and other facilities available for the service of their less affluent patients—e.g., convalescent homes, hostels for mothers and infants, training schemes for cripples, boarding-out in the country, clinics and dispensaries, &c.

The fact that we are so frequently consulted leads us to suppose that our services might be of use to other members of the medical profession who, not being aware of our existence, do not enjoy the convenience of the information we can supply. The Society publishes annually a Charities Register and Digest containing on 540 pages the particulars of several thousands of institutions. This is as comprehensive and up to date a record as we are able to make it of the institutions whose services are likely to be required for people in London and the south of England.

As regular readers of your journal, however, we have some notion of the innumerable preoccupations of a practising physician, and realise that he has little or no time to refer to the pages of a book of reference of this kind. He would, we are sure, find it more expeditious to write or telephone to this office, or to the District Office nearest him (Telephone Directory, page 291) stating the information of which he is in need. Our staff are always delighted to reply to such queries, and are, in fact, constantly doing so.

I am, Sir, yours faithfully,

J. C. PRINGLE.

Charity Organisation Society, 296, Vauxhall Bridge-road, S.W., August 4th, 1933.

MONGOLISM IN TWINS

To the Editor of THE LANCET

SIR,—In his account of a case of mongolism in both of twins (THE LANCET, April 15th, p. 802) Dr. P. M. G. Russell seems to me to have reached more definite conclusions than his data warrant. In the first place, were these girls identical twins or were they not? There are several cases in the German and American literature of twins which have had separate fœtal membranes but which appear nevertheless to be identical twins. Yet the proof that his mongolian twins are identical is based mainly on the membranes. The fact that the twins were virtually identical in four characteristics (sex, birth weight, head circumference, and the complex of "mongoloid" characters) strongly suggests that the twins were identical. Under these circumstances the "non-identity" of the twins can hardly be accepted if this is to be considered a crucial case.

The other difficulty is even more serious. Non-identical twins resemble each other to about the same extent as ordinary brothers and sisters. Thus in a family in which part of the children are blue-eyed and part brown-eyed, one twin may have blue eyes and the other brown, just as sibs may differ in eye colour. To argue that because non-identical twins are alike in eye colour, is proof that eye colour is not inherited, would on the face of it be absurd. Furthermore, to say as Dr. Russell does that "bearing in mind the rarity of mongolian idiocy, the chances seem infinitesimally slight that two ova should become simultaneously fertilized out of the large number which ovulate during a woman's child-bearing life and both daughters bear this hypothetical germinal defect," seems confusing and inaccurate. The fœtus results not from an ovum, but from the union of ovum and sperm. If we assume that mongolism is caused by a recessive gene it is necessary that both parents transmit this gene if any of the children are mongolian idiots. If the two parents carry such a recessive defect there is one chance in four that a given child will be a mongolian idiot. If two recessive genes are involved there is one chance in sixty-four that any given child will be a mongolian idiot. Other arrangements of genes are possible and are well known to genetic science which can give various other chances for the appearance of a given characteristic. These chances are small, perhaps, but they are not "infinitesimally slight." If a genetic cause is operative, there is a definite chance that a given characteristic will reappear in two consecutive fertilisations and it is very questionable logic to adduce such an occurrence as conclusive proof of the absence of heredity.

It seems to me that the possibility of a genetic basis for mongolism is strengthened rather than weakened by this case. Whether it is to be accepted as a final proof of either hypothesis is very questionable, but it does emphasise the need for recording every case of mongolism in twins, with as complete data as possible. In this instance detailed records of fingerprint patterns and other characteristics would have added enormously to the value of the report. I am, Sir, yours faithfully,

ROBERT C. COOK,
Editor, *Journal of Heredity.*

Washington, D.C., July 28th, 1933.

"THE INJURED WORKMAN"

To the Editor of THE LANCET

SIR,—While I greatly appreciate your kindly review last week of my section of "The Injured Workman," I am afraid one rather involved sentence of mine has been misunderstood. In the sentence quoted as suggesting that compensation might be awarded for something other than loss of wage-earning power, the words are: "And secondarily *from* deformity and pain"—"from" not "for." My intention in writing this was to point out that a man might be disabled in the first place because he had lost an eye, thereby losing some of his visual power; secondarily because he was a deformed man and therefore could not be given a job; and thirdly because his eye, when he attempted to use it for any work, although the sight was fairly good, caused him some distress, which made his work very poor. A great many cases such as this, involving corneal injuries, are fought on the grounds mentioned under the heading "secondarily."

I am, Sir, yours faithfully,

Leeds, August 7th, 1933. JOHN FOSTER.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

NO FEDERAL AID FOR PUBLIC HEALTH

WHILE millions of dollars of federal money are being distributed to the States to aid in highway construction, public works, and the relief of indigency, no federal subventions have been allotted by Congress for the preservation of the public health. On the contrary, the $300,000 which was granted in the last fiscal year to support county units with full-time health officers has been withdrawn, with the result that many of the full-time men are likely to lose their employment. Urgent representations have been made to the administrator in Washington of federal relief. An offer has been extended by him to allow health officers to spend part of their time in the administration of poor relief and to allow them a subsidy for such services. Public health officials regard this as a dangerous proposal. For many years they have sought to educate the public to a conception of preventive medicine that goes beyond medical relief of indigents. To designate health officers as physicians to the poor would undo all these years of educational work and open the door to the acceptance of responsibilities so vast that any constructive public health work would become impossible. It must be realised that in this country there is usually, except in large cities, almost no provision for medical aid to the poor, and any health officer of a rural unit would soon find himself swamped under a load of work that no one man could carry. The difficulty of defining indigency and determining which person is entitled to free care is also very great, and a failure to make proper distinction inevitably leads to strained relations with colleagues in private practice. An appeal is now being made directly to the President himself to set aside some fund for aid to public health work until Congress reconvenes and can act to relieve the emergency.

INTRAVENOUS USE OF BARBITAL COMPOUNDS

The council on pharmacy and chemistry of the American Medical Association has just published a second report on the use of barbital compounds intravenously. In its first report, made public on Dec. 19th, 1931, the council concluded that: "their intravenous use should be limited for the present to conditions in which oral administration is not feasible either because the patient is unconscious, as in cerebral hæmorrhage, eclampsia, or status epilepticus, or because he resists, as in delirium, or because a very prompt action is imperative, as in convulsion from local anæsthesia." The council has refrained from approving products unless their advertisement for intravenous use has been limited to the above conditions. Recently new soluble barbiturates have been developed and the question has been raised as to whether the ruling of the council should be revised. A large number of authorities have been consulted and they agree on the whole, though not unanimously, that the barbiturates should not be used intravenously except under the stated conditions. Dr. George W. Crile, for example, is against intravenous anæsthesia in any form whatsoever on the ground that the anæsthetic is irrecoverable—an objection which might be applied by the way with only somewhat less force to oral or rectal anæsthesia with the same drugs. The council has determined to make no change in its ruling.

PUBLIC HEALTH SERVICES

The Health of a Tourist County

AT a meeting of the Cumberland county council last week a novel reason was given for making the county a healthier place. The vice-chairman of the public health and housing committee remarked that the council wanted to advertise Cumberland to get more tourists; hence it must recognise that the health committee should face in the coming year a big increase in expenditure on the development of health services. The annual report on these services was before the council at this meeting, and in it Dr. Kenneth Fraser, who has succeeded Dr. F. H. Morison as county medical officer, remarked on the definite development of a "health sense" in the county of recent years, particularly desirable in the case of Cumberland where industries which had been the main source of income in the past had almost ceased to exist. Thus the alternative source of income—the development of the county as a holiday and tourist centre—becomes much too valuable to disregard. Cumberland, says Dr. Fraser, was an area with unique advantages; the Roman wall was exceptionally rich in historical interest; there was a large section of the English lakeland within its borders; certain areas such as Silloth and Alston were exceptionally bracing areas for the convalescent or the seeker after health. Therefore he submitted that a high standard of hygiene ought to be a part of the county's stock-in-trade. The tourist or the convalescent had the right to expect at least a pure water-supply, a properly controlled milk-supply, and a generally high standard of sanitation. No doubt over a large part of the county these things were provided, but as the report shows, the vital statistics give cause for anxiety in some directions. While the death-rate from pulmonary tuberculosis in the administrative counties of England has been more or less steadily falling for the past 11 years, the death-rate in Cumberland has shown no corresponding fall. Notifications of non-pulmonary tuberculosis are actually rising. A good deal of the rise, however, Dr. Fraser thought, might be attributed to improvement in the methods of diagnosis and likely to yield to the more intensive supervision of tuberculosis in cattle. And yet under existing conditions he saw no hope of any substantial improvement in the tuberculosis problem as it existed in the county. A high percentage of cases of tubercle came to the knowledge of his department at such a stage in their illness that treatment of any kind was futile, and the attitude of the general public to the infectivity of the disease remained highly unsatisfactory. To give one or two examples out of many available, he cited at least one advanced case of tuberculosis married during the year. In another household an advanced case returned from sanatorium to die, and slept in the same bed with another child up to the time of her death; not surprisingly this child had since developed tubercle. Two tuberculous married persons, both of whom had advanced tubercle, declined to allow their children to be removed from the home to an excellent institution prepared to receive them, and no argument could influence their decision. These examples, he thought, were very disquieting. The housing of tuberculous persons was, so far as he was aware, a matter in which no steps had been taken by any sanitary authority within the county. It was

surely unfortunate that in the housing schemes a proportion of the newly built houses had not been set apart for the use of households in which there were tuberculous persons. Dr. Fraser quoted with approval the action of the borough of Walsall in 1931 in providing 50 houses for special cases recommended by the health committee or who were living in very bad conditions. Finally, he referred to the legal aspects involved in the letting of premises previously occupied by tuberculous persons, and to the case tried in the King's Bench Division in June, 1923 (see THE LANCET, 1923, ii., 34). Provision for the segregation of advanced cases in the county was also quite inadequate, and it was clear, he said, that the problem of the provision of beds for advanced cases must be faced at an early date on a scale and in a manner not even contemplated hitherto. These are serious words addressed to a sanitary authority, and they evidently made an impression at the meeting of the council, although several members were inclined to ascribe the increase entirely to the effect in the county of ten years' underfeeding, unemployment, and malnutrition; but more than one member was willing to admit that economies in the future must come from some other source than from the health committee.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 29TH, 1933

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 7 (last week 4); scarlet fever, 2179; diphtheria, 920; enteric fever, 51; acute pneumonia (primary or influenzal), 491; puerperal fever, 26; puerperal pyrexia, 98; cerebro-spinal fever, 20; acute poliomyelitis, 21; acute polio-encephalitis, 1; encephalitis lethargica, 5; continued fever, 1 (Bury St. Edmunds); dysentery, 8; ophthalmia neonatorum, 92. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 1st–2nd was as follows: Small-pox, 17 under treatment, 1 under observation (last week 27 and 0 respectively); scarlet fever, 2044; diphtheria, 1632; enteric fever, 16; measles, 595; whooping-cough, 380; puerperal fever, 26 mothers (plus 8 babies); encephalitis lethargica, 256; poliomyelitis, 2; "other diseases," 201. At St. Margaret's Hospital were were 17 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 19 (4) from measles, 6 (1) from scarlet fever, 18 (9) from whooping-cough, 29 (8) from diphtheria, 27 (5) from diarrhœa and enteritis under two years, and 10 (3) from influenza. The figures in parentheses are those for London itself.

Birmingham reported the only death from enteric fever outside London. Measles was fatal in 3 cases at Liverpool, 2 each at Bolton, Wallasey, West Hartlepool, and Plymouth. Four deaths from diphtheria occurred at Manchester, 2 each at Brentford and Chiswick, Liverpool, Sheffield, and Merthyr Tydfil. Of the deaths from diarrhœa outside London, 5 were reported from Liverpool, 3 from Manchester.

The number of stillbirths notified during the week was 242 (corresponding to a rate of 39 per 1000 total births), including 33 in London.

OBITUARY

SIR JOSEPH VERCO, M.D. Lond., F.R.C.S. Eng.

CONSULTING PHYSICIAN TO THE ADELAIDE HOSPITAL

ON July 30th there died in Adelaide Sir Joseph Verco, one of the best-known physicians in Australia. He had reached the age of 82.

Joseph Cooke Verco was born in Fullarton, South Australia, in 1851, and educated at Young's Educational Institution and St. Peter's College, Adelaide. He came to England for a medical training, and entered in 1870 St. Bartholomew's Hospital, where he had a distinguished career. He qualified in 1874 as M.R.C.S., and graduated with first-class honours and a gold medal as M.B. Lond. in the following year, taking also the diploma of L.R.C.P. While serving as house physician at St. Bartholomew's in 1876 he proceeded to the M.D. Lond., where he was again a gold medallist. In 1877 he took the F.R.C.S. Eng. and the B.S. Lond., when he was gold medallist for a third time. Undoubtedly Verco had a life in England of professional success open to him. But he was loyal to his native land.

Verco returned to Adelaide in 1878 with remarkable testimonials and, in spite of his comparative youth, obtained at once a considerable practice and made a sound reputation. He was appointed physician to the Adelaide Hospital and the Adelaide Children's Hospital and lecturer on medicine in the University of Adelaide, and soon came to be regarded as one of the leading medical authorities in the Commonwealth. In 1919 he was knighted and shortly afterwards was selected by the Council of the Adelaide University to be its representative at the 800th anniversary of St. Bartholomew's Hospital, on which occasion he paid his first visit to England since his return to Australia. He retired from practice some ten years ago, but always preserved his interest in medicine.

WILLIAM ALEXANDER SMITH, M.B. Oxf., M.R.C.S. Eng., F.C.S.

WE regret to announce the death of Dr. William Alexander Smith, which occurred in Cambridge on August 3rd at Glebe-road, Cambridge. He was a highly accomplished man and an unusual blend of the practical doctor and the savant. The eldest son of the late Mr. William Smith, a Bristol surgeon, he was born in 1852, educated at Clifton and at Oxford where he obtained first-class honours in the Natural Tripos in 1875. He completed his medical training at St. Mary's Hospital and graduated M.B. Oxford in 1880, taking the M.R.C.S. at the same time. Shortly afterwards he married May, daughter of Mr. Mark Whitwill, and went into general practice in Essex at the village of Newport near Saffron Walden. He was immediately placed upon the staff of the Saffron Walden Hospital, and soon became known to the neighbourhood as a sound practitioner on all three sides of his calling, while his application to the literature of science in general and philosophy acquired for him a well-deserved reputation as a learned man. He practised in Newport for 27 years, leaving in 1908, when he retired from practice and went to live at Clifton. There during the war he did excellent local service as a medical referee on the Bristol War Pensions Committee. Two years ago his health began to fail, and he removed to Cambridge, where he had relatives, and where he found congenial society and opportunities of pursuing the literary studies to which he was devoted.

Dr. J. A. Browne, who succeeded Dr. Smith in practice at Newport, has sent us a tribute to his friend from which we quote the following: "In him Oxford had developed a scholar and a gentleman of her best

type, and such he remained to the end. Tall, rather gaunt, with piercing, deep-set eyes, and old-fashioned military moustache, he had a striking and commanding presence more like a General of Infantry than a country doctor. But such he was and well content to be so, though his qualities would have fitted him to admirably fill a professorial chair. His kindliness, his courtesy, his conscientiousness, his outstanding ability and the humility which goes with great knowledge combined to make him esteemed alike by his patients and by a wide circle of friends. It would be difficult indeed to find a man more beloved and respected. There was a transparent sincerity and simplicity about him combined with a kindly humour and a shrewd judgment of men and things that made up a singularly delightful personality. An omnivorous reader, he absorbed and assimilated a vast amount of learning, so that there was scarcely a subject on which he could not make an illuminating remark or raise a suggestive question. At one time he used to go his rounds on horseback reading a book as he rode, and he and the horse have been seen by the roadside each taking a noonday 'bait' while Smith read poetry aloud between mouthfuls! His personal habits were of the simplest though he was extremely hospitable, and distinguished men were glad to sit at his table to enjoy the charms of his conversation. Professionally, Smith was a careful and scientific physician and an excellent surgeon. He keenly kept himself abreast of the advancing body of medical knowledge. His opinion was valued by his colleagues and commanded respect, while it was always delivered with a characteristic modesty and hesitancy."

MEDICAL NEWS

University of Oxford

At two recent congregations the following degrees were conferred :—

M.Ch.—A. E. Porritt.

B.M.—H. J. Barrie, J. H. B. Beal, G. E. M. Benson, Alan Carling, C. C. Cobb, Eric Fowler, I. H. Gosset, Thomas Hardy, D. A. Jennings, J. E. Lewis, J. E. Morley, H. R. Bathurst Norman, P. E. F. Routley, René Thomas, and Clifford Wilson.

Royal Colleges of Physicians and Surgeons

At the final examination of the conjoint board held from July 3rd to 28th, the following candidates were approved in the subjects indicated, but are not yet eligible for the diplomas of the Colleges :—

Pathology.—S. R. Ali, Bombay and King's Coll. ; A. G. V. Aldridge, Camb. and Birmingham ; R. A. Andrews, Camb. and Guy's ; M. Appelman, St. Bart.'s ; J. C. Baillie, King's Coll. ; Dorothy E. Barber, Bristol ; Louie M. M. Beadnell, Univ. Coll. ; Mary A. M. Bigby, Royal Free ; E. W. Bintcliffe, St. Bart.'s ; E. A. Bisson, London ; R. H. Blazeby, Guy's ; P. R. Boucher, St. Mary's ; A. G. W. Branch, Bristol ; A. S. Bullough, Manchester ; J. A. C. Burridge, King's Coll. ; Ruth M. Campbell, Royal Free ; A. M. R. Cann, Middlesex ; W. A. Carey, Camb. and King's Coll. ; R. Carpenter, H. G. Cereseto, and J. A. Chivers, St. Bart.'s ; K. H. Clark, St. Mary's ; R. M. Clarke, Middlesex ; C. W. J. Claydon, King's Coll. ; P. Crann and J. H. Crawford, Leeds ; P. E. Cresswell, Oxon and Guy's ; Enid G. M. Cummings, Royal Free ; E. A. Danino, St. Bart.'s ; E. R. Dansie, King's Coll. ; D. H. Davies, Camb. and Middx. ; D. R. Davies and Enid S. Davies, Univ. Coll. ; H. S. Davis, Camb. and Charing Cross ; G. De Lacey, London ; Rosalind M. S. Derham, Bristol ; D. G. F. Edward, St. Bart.'s ; A. G. Edwards, Guy's ; L. J. L. Edwards, St. Bart.'s ; C. E. Elliott, Camb. and St. George's ; H. L. Ellis, Middx. ; M. Epstein, St. Bart.'s ; Constance E. Field, Univ. Coll. ; J. F. A. Forster, Guy's ; J. C. Garland, Middx. ; Mary I. Gibson, Royal Free ; S. S. B. Gilder, London ; A. E. Ginn, Guy's ; R. I. N. Greaves, Camb. and St. Mary's ; J. Greenhalgh, Guy's ; G. D. Hadley, Camb. and Middx. ; Susanna M. Halliday, Edin. ; W. H. Hamilton, Guy's ; Beatrice J. Haram, Royal Free ; G. D. Harthan, Manchester ; A. E. M. Hartley, Camb. and St. Mary's ; J. N. Heales, Bristol ; J. C. Henry, Guy's ; R. Hill, St. Mary's ; R. D. Holloway, Camb. and St. George's ; Elizabeth M. James, Royal Free ; B. S. Jones, Camb. and London ; F. A. Jones, St. Bart.'s ; I. D. Jones, Middx. ; A. C. Kanaar, St. Bart.'s ; A. R. Kennedy, Manchester ; M. A. Khan, West London ; G. A. Kiloh, King's Coll. ; J. R. Kingdon, St. Bart.'s ; Gwendoline D. Knight and Mildred G. Latham, Royal Free ; K. A. Latter, St. Bart.'s ; A. P. R. Lewis, Westminster ; L. F. E. Lewis, Manchester ; Phyllis S. Lockie, Univ. Coll. ; K. Lumsden, Camb. and St. Bart.'s ; J. McArthur, Guy's ; L. C. Martin, Camb. and Middx. ; A. G. C. Mason and S. P. Mason, Middx. ; R. A. Mathews, Bristol ; S. A. Mian, Punjab and West London ; S. G. Mohler, St. Mary's ; R. H. Moodie, Bristol ; J. N. Morris, Univ. Coll. ; C. J. B. Murray, Middx. ; Frances C. Naish, Camb. and Royal Free ; P. H. Newman, Middx. ; P. B. L. Nicholas, London ; Margaret M. O'Connor, Royal Free ; A. Orlek, St. Bart.'s ; N. C. Oswald, Camb. and Charing Cross ; H. C. Palin, Manchester ; M. L. Pan, St. Bart.'s ; C. G. Parsons, Birmingham ; J. E. G. Pearson, Oxon and Middx. ; Margaret R. Price, Royal Free ; L. Rabinovitch, Leeds ; S. Rameshwer, Lucknow and Middx. ; C. Reburn, St. Mary's ; J. D. Richardson, King's Coll. ; M. S. Richmond, Leeds ; M. Ripka, London ; P. H. Sandifer, Middx. ; B. J. Sanger, London ; I. C. Sarwal, St. Bart.'s ; P. R. Saville, London ; N. H. Seaton, Univ. Coll. ; I. I. Seidman, St. Bart.'s ; A. I. Shaw, Univ. Coll. ; A. L. L. Silver, Oxon and London ; H. G. Silvester, Univ. Coll. ; G. E. T. Soden, St. Bart.'s ; J. Starkie, Manchester ; K. F. Stephens, St. Bart.'s ; D. L. M. Stewart, King's Coll. ; A. J. Stolow, Charing Cross ; S. Sunkavally, Madras and London ; Alice C. N. Swanston, Royal Free ; Elisabeth J. M. Thomas, Univ. Coll. ; H. W. Thomas, London ; R. E. Thomas, Univ. Coll. ; A. S. Till, Camb. and Middx. ; L. N. Trethowan, Guy's ; Beryl Twyman, Univ. Coll. ; T. P. Ward, Camb. and St. Thomas's ; M. Williams, Camb. and St. George's.

Medicine.—S. R. Ali, Bombay and King's Coll. ; J. B. Andosca, King's Coll. ; M. Appelman, St. Bart.'s ; N. Asbell, Westminster ; A. J. N. X. Babapulle, Ceylon and King's Coll. ; Bridget M. Barcroft, Camb. and Royal Free ; Mary A. M. Bigby, Royal Free ; Muriel Boycott, Univ. Coll. ; G. C. Brown, Camb. and St. Mary's ; R. E. Browne, King's Coll. ; A. G. Butters, St. Bart.'s ; K. L. Buxton, Camb. and St. Thos. ; J. A. Chivers, St. Bart.'s ; J. D. Cruickshank, Birmingham ; Enid G. M. Cummings, Royal Free ; D. O. Davies, St. Bart.'s ; E. Davis, Manchester ; F. H. D'Souza, Guy's ; T. H. Dias, Ceylon and King's Coll. ; W. L. Dove, Liverpool ; E. Dunsby, Leeds ; P. Emmerson, Durham ; G. H. D. Evans, Cardiff ; S. Y. Feggetter, Durham ; C. J. Gavey, London ; C. A. George, St. Bart.'s ; S. W. Gillman, Univ. Coll. ; R. M. Haines, Westminster ; S. A. Hasan, London ; Winifred M. Hill, Bristol ; M. H. Hosny, Birmingham ; A. V. House, Bristol ; Elizabeth M. James, Royal Free ; J. W. James, Univ. Coll. ; E. H. Johnson, Leeds ; W. L. Kerr, King's Coll. ; L. F. E. Lewis, Manchester ; P. C. Matthew, Camb. and Univ. Coll. ; N. H. Merchant, Univ. Coll. ; S. A. Mian, Punjab and West London ; Barbara G. Morton, Royal Free ; A. A. K. Naqsh-Bandi, Univ. Coll. ; P. B. L. Nicholas, London ; W. S. Nutt, Camb. and King's Coll. ; Margaret M. O'Connor, Royal Free ; A. Orlek and M. L. Pan, St. Bart.'s ; S. A. Razvi, Birmingham ; A. J. Rouse, St. Bart.'s ; M. F. P. Ryan, King's Coll. ; G. R. Sedleigh-Denfield, St. Bart.'s ; R. H. Shah, Manchester ; A. J. Stolow, Charing Cross ; W. P. M. Telfer, St. Bart.'s ; E. Vernon, and C. S. Walker, Manchester ; Sarah C. B. Walker, Royal Free ; J. H. Walters, Camb. and King's Coll. ; I. Zieve, Guy's.

Surgery.—A. K. Acharya, Calcutta and West London ; S. H. Alavi, St. Thomas's ; T. G. Armstrong, Camb. and London ; H. H. Atkinson, Univ. Coll. ; W. R. Billington, Camb. and Birmingham ; P. R. Boucher, St. Mary's ; J. A. Brocklebank, Guy's ; J. C. H. Browne, Middx. ; F. B. Champion, Guy's ; D. R. Davies, Univ. Coll. ; E. Davis, Manchester ; G. V. W. Doherty, Guy's ; P. J. England, Cardiff ; S. Y. Feggetter, Durham ; T. Fitt, Camb. and St. Thomas's ; Mary I. Gibson, Royal Free ; J. G. A. Gilruth, Camb. and Univ. Coll. ; B. S. Grant, London ; C. L. Greening, Durham ; A. H. Hall, Univ. Coll. ; Susanna M. Halliday, Edinburgh ; R. S. Handley, Middx. ; R. R. Henderson, St. Thomas's ; G. T. Hindley, Camb. and St. Bart.'s ; K. Hooper, Guy's ; A. C. L. Houlton, Camb. and St. Bart.'s ; A. V. House, Bristol ; N. M. Jacoby, Guy's ; Maisie F. James, Royal Free ; H. W. E. Jones, St. Thomas's ; J. B. Jordaan, Guy's ; R. Judson and A. R. Kennedy, Manchester ; Alice M. Kenny, West London ; R. L. Kerr, Camb. and St. Mary's ; Phyllis M. Kerridge, Univ. Coll. ; Alfreda W. Krichauff, Adelaide ; J. Lees, Camb. and St. Thomas's ; W. L. Lister, St. Mary's ; Gwladys R. Llewelyn, Bristol ; Phyllis S. Lockie, Univ. Coll. ; O. Lyth, Guy's, W. M. Macleod, St. Thomas's ; Bertha Marston, Birmingham ; K. W. Martin, St. Bart.'s ; W. N. M. Mason, Liverpool ; J. E. Morrish, St. Mary's ; G. A. Myers, New Zealand ; Frances C. Naish, Camb. and Royal Free ; R. Nightingale, Manchester ; D. G. Oehlers, London ; Doris E. Oxford, Royal Free ; R. S. Pachnanda, King's Coll. ; B. H. Page, Camb. and London ; R. S. Pepperdine, Manchester ; J. Phillips, Univ. Coll. ; E. G. Pyne, Camb. and Charing Cross ; Florence C. Read, Manchester ; V. B. Reckitt and J. E. Rowlands, Guy's ; D. Saklatvala and E. Shipman, Univ. Coll. ; J. Smart, Camb. and St. Bart.'s ; O. C. Smith, Univ. Coll. ; M. S. Spink, Camb. and Guy's ; A. B. Stenhouse, Oxon and St. Thomas's ; W. J. Stokes, London ; K. R. Tattersall and S. J. L. Taylor, St. Thomas's ; Elisabeth J. M. Thomas, Univ. Coll. ; Elizabeth D. Thompson, Camb. and Leeds ; S. M. Thompson, Leeds ; D. M. Thomson, St. Bart.'s ; G. L. B. Thurston, Guy's ; Lilian E. Tracey, Royal Free ; G. R. Usmar, Sheffield ; Winifred J. Wadge, Univ. Coll. ; S. H. Wass, Guy's ; W. F. Walton, Camb. and St. Thomas's ; J. T. Watkins, Cardiff ; F. E. Wheeler, St. Bart.'s ; M. E. Wigfield, St. Thomas's ; O. H. M. Woodbridge, Guy's ; A. R. C. Young, St. Bart.'s.

Midwifery.—A. R. Agati, St. Thomas's ; D. E. W. Anderson, London ; W. G. R. Ashley-Emile, Middlesex ; K. C. Bailey, St. Thomas's ; Dorothy E. Barber, Bristol ; J. E. Barker, St. Bart.'s ; H. H. Bayley, Camb. and King's Coll. ; R. H. R. Belsey and T. A. Best, St. Thomas's ; I. S. Bhalla, Univ. Coll. ;

C. J. F. Blumenthal, Guy's; I. N. Blusger, St. Bart.'s; L. C. Bousfield, Middlesex; Helen M. Bower-Alcock, King's Coll.; P. G. Burgess, Oxon and Manch.; A. E. Burjony, Durham; E. M. Buzzard, Oxon and St. Thomas's; I. Byer, St. Bart.'s; A. M. R. Cann, Middlesex; C. M. Carlyle-Gall, St. Thomas's; A. M. Chapnick, Westminster; R. M. Clarke, Middlesex; C. D. Clements, Univ. Coll.; P. Crann, Leeds; A. N. F. Critchley, St. George's; F. Croft, St. Bart.'s; J. H. J. Crosse, Camb. and St. Bart.'s; F. Crowther, Guy's; Enid G. M. Cummings, Royal Free; R. S. Dale, St. Mary's; M. C. Damkengrit, Camb. and St. Thomas's; D. W. Davies, Middlesex; G. de Lacey, London; A. R. O. Denton, Guy's; Rosalind M. S. Derham, Bristol; N. J. Dias, D. G. F. Edward, and L. J. L. Edwards, St. Bart.'s; C. E. Elliott, Camb. and St. George's; H. D. Fairman, London; Constance E. Field, Univ. Coll.; W. T. J. Fowler, Guy's; J. A. C. Franklin, St. Thomas's; J. French, St. Bart.'s; J. C. Garland, Middlesex; H. J. Gaudin, Otago; Mary I. Gibson, Royal Free; S. S. B. Gilder, London; R. I. N. Greaves, Camb. and St. Mary's; S. Grodd, Cape and St. Mary's; J. T. Hallett, Camb. and St. Thomas's; L. D. Harris, St. Mary's; A. E. M. Hartley, Camb. and St. Mary's; J. N. Heales, Bristol; D. F. Heath, Birmingham and Durham; F. S. M. Heggs and R. R. Henderson, St. Thomas's; R. Hill, St. Mary's; J. Holme, Manchester; H. G. Howitt, London; R. S. Illingworth, Leeds; Maisie F. James, Royal Free; J. E. Jameson, St. Thomas's; F. J. G. Jefferiss, St. Mary's; I. H. Jenkins, St. Thomas's; J. F. E. Johnson, Manchester; B. S. Jones, Camb. and London; E. J. Jones, Cardiff and Middlesex; E. G. Jones, St. Bart.'s; I. R. Jones, Cardiff; J. E. V. Jones and L. E. Jones, St. Thomas's; W. M. P. Jones, Cardiff; R. Judson, Manchester; A. C. Kanaar, St. Bart.'s; L. M. Kelly, St. Thomas's; Phyllis M. Kerridge, Univ. Coll.; M. B. Khan, Leeds; J. R. Kingdon, St. Bart.'s; J. W. J. Knowles, St. Thomas's; A. W. Krichauff, Adelaide and West London; J. V. Laverick, St. Bart.'s; J. H. Lawrence, Leeds; T. Levitt, Middlesex; A. P. R. Lewis, Westminster; Phyllis S. Lockie, Univ. Coll.; R. Lyons, St. Bart.'s; W. D. F. Lytle, St. Thomas's; J. B. H. McArthur, Guy's; G. S. Malvai, Durham; J. W. Mansie, Guy's; E. H. Markby, Leeds; J. S. Marr, Aberdeen and London; K. W. Martin, Camb. and St. Bart.'s; J. D. Martin-Jones, St. Bart.'s; J. Mason and S. P. Mason Middlesex; G. A. Myers, New Zealand; W. S. Nutt, Camb. and King's Coll.; Ivy E. Oliver, Royal Free; J. F. O'Malley, Guy's; G. R. C. Palmer, St. Thomas's; M. L. Pan, Calcutta and St. Bart.'s; H. F. Patrick, St. Thomas's; J. E. G. Pearson, Oxon and Middlesex; R. S. Pepperdine, Manchester; D. S. Piper, Guy's; G. D. Pirrie, King's Coll.; G. T. Pitts, St. Thomas's; J. D. Powell, Camb. and St. Bart.'s; C. H. G. Price, Bristol; Margaret R. Price and Silvia W. Pyddoke, Royal Free; S. Ramgoolam, Univ. Coll.; T. R. F. Raw, Guy's; D. C. Reavell, St. Bart.'s; G. W. D. Reeves and J. W. Rhys, Guy's; E. A. Richards, St. Thomas's; H. D. Robinson, Guy's; A. T. Roden, St. Bart.'s; K. B. Rogers, St. Mary's; Helen E. Rogerson, Manchester; Picotee E. Rose-Innes, Royal Free; Ruth A. Rushton, Camb. and Univ. Coll.; H. S. K. Sainsbury and B. J. Sanger, London; I. C. Sarwal, St. Bart.'s; R. S. F. Schilling, St. Thomas's; B. Selwyn, St. Bart.'s; A. I. Shaw, Univ. Coll.; D. J. Sheehan, St. Bart.'s; H. J. Sherren, Camb. and St. Thomas's; E. Shipman, Univ. Coll.; F. J. C. Smith, Camb. and London; G. G. Smith, St. Thomas's; L. I. Sobiya and R. L. Soper, Guy's; K. F. Stephens, St. Bart.'s; A. J. Stolow, Charing Cross; S. Sunkavally, Madras and London; J. S. F. Sutton, Guy's; R. E. Thomas, Univ. Coll.; Elizabeth D. Thompson and S. M. Thompson, Camb. and Leeds; G. C. Tooth, St. Bart.'s; Lilian E. Tracey, Royal Free; Beryl Twyman, Univ. Coll.; E. Vernon, Manchester; Elsie E. Vincent, Royal Free; R. S. Vine, Guy's; Winifred J. Wadge, Univ. Coll.; C. S. Walker, Manchester; Sarah C. B. Walker, Royal Free; T. E. M. Wardill, St. Bart.'s; J. T. Watkins, Cardiff; C. R. H. Weekes, Camb. and St. Bart.'s; E. T. Weekley, Camb. and St. Thomas's; P. A. Wilkinson, Guy's; G. Williams, St. Mary's; M. W. Williams, Univ. Coll.; and B. L. E. Wong and K. H. Wright, Guy's.

Royal College of Physicians of London

On August 3rd licences to practise were conferred upon the following 25 candidates who have completed the final examination of the conjoint board. These candidates had not completed their examination in time for the meeting of the comitia on July 27th:—

G. E. M. Benson, Oxford and St. Thomas's; C. G. Bree, Univ. Coll.; N. Chakravarty, Calcutta and St. Bart.'s; J. J. Chatterton, Bengal and St. Mary's; A. Das, Calcutta and Middlesex; Helen E. Dimsdale, Camb. and Univ. Coll.; R. G. Fear, St. Bart.'s; E. C. Fountaine, Camb. and St. Bart.'s; D. L. Fromow, London; Pearl M. Heirshberg, Royal Free and West London; C. E. W. Hoar, Westminster; J. R. Hughes, Cardiff and Middlesex; B. F. Jackson, St. Bart.'s; W. W. Jolly, Adelaide and Middlesex; S. H. Kessler, King's Coll.; G. D. Lehmann, Univ. Coll.; R. M. Littledale, Middlesex; J. A. S. Marr, Cape and Middlesex; T. Miles, St. Thomas's; R. Ram, Lahore and West London; M. Richmond, London; M. A. Rugg-Gunn, Camb. and St. George's; P. Simon, Birmingham and Cardiff; P. G. Stainton, Guy's; and C. H. Yeoh, Oxford and St. Thomas's.

Royal College of Surgeons of England

An ordinary meeting of the council was held on August 3rd, with Sir Holburt Waring, the president, in the chair.

Mr. E. B. Dowsett and Mr. A. T. Pitts were re-elected members of the board of examiners in dental surgery, and Mr. R. Davies-Colley was elected an examiner in pathology. The fourth Macloghlin scholarship of £120 per annum for medical students was awarded to Frank Philip Powell, of Monmouth School.

Diplomas of membership were granted to 142 of the 143 candidates whose names were given in our last issue (p. 331) as recipients of the L.R.C.P. (with the exception of P. N. Cutner), and also on the 25 new licentiates whose names will be found under the heading of Royal College of Physicians of London.

University of London

Sir Edwin Cooper Perry, M.D., has been appointed as a Crown member of the university court for a further five years.

At a meeting of the senate on July 19th the title of professor of helminthology, conferred on Dr. R. T. Leiper in 1919, was changed to William Julien Courtauld professor of helminthology.

The degree of Ph.D. in bacteriology was conferred on M. A. H. Gohar (Lister Institute), and the degree of Ph.D. in pathology on P. R. Rao (St. Bart.'s Hospital).

Among recipients of grants under the Thomas Smythe Hughes medical research fund and the Beaverbrook fund are Dr. Donald Hunter, for special assistance in connexion with his study of the relationship of disordered hæmopoiesis to bone disease (at the London Hospital), and Prof. M. F. Lucas Keene for assistance in research on the development of the brain-stem in the human fœtus and infant, which is an extension of an earlier investigation of myelination (London School of Medicine for Women).

The senate invites applications for the university readership in pharmaceutics, tenable at the College of the Pharmaceutical Society, and also for the William Julius Mickle fellowship, which is awarded to the graduate of London University who, being resident in London, has in the opinion of the senate done most to advance medical art or science within the preceding five years. Further particulars may be had from the academic registrar of the University.

The Semon lecture for 1933 will be given on Nov. 2nd by Dr. H. Burger, professor of otolaryngology at Amsterdam, his subject being the so-called associated paralyses of the larynx and pharynx (multiple cranial nerve palsy). Mr. C. L. Burt, professor of psychology in the University, will give the Heath Clark lectures, on the normal and subnormal mind, on Oct. 18th and 25th, and Nov. 1st, 8th, and 15th.

Hospital Staff and a Contributory Scheme

The honorary medical staff of the North Lonsdale Hospital, Barrow-in-Furness, recently asked the council to pay to the medical staff fund 1 per cent. of the sum subscribed to the hospital's contributory scheme. The staff considered that 20 per cent. would be "a just and reasonable figure," but in order to secure the principle, and "not unmindful of the national and local financial conditions," were willing to accept a nominal proportion. The council has refused to make any such payment "until the whole question is dealt with nationally." In consequence of this refusal the hon. medical staff intimated that its services would be withdrawn after July 31st. Dr. Lorton Wilson, stating the point of view of the staff in a published letter, wrote as follows:—"When the hospitals provided service for one section of the community—the poor—the medical profession had no complaint . . . indeed, it gave its services gladly and freely. But now that hospitals offer a specialist service to a wider class, embracing four-fifths of the population, the medical profession can no longer regard this as a work of charity, but must, if only for its own preservation, put forward its claim for just and proper recognition of its services. Those who can afford nothing should pay nothing, either to hospital or to doctor. Those who can afford private fees should pay them. . . . The contributory scheme is an organisation not of the poor, but of the provident, who wisely obtain by insurance a cover that they would find difficult to obtain directly. In Barrow-in-Furness the contributor who does not require charity is forced by the attitude of the authorities of the North Lonsdale Hospital to appear as an object of charity in that under existing arrangements skilled medical and surgical treatment must be given free, although payment is made towards hospital expenses."

The council of the hospital issued a long reply (*Barrow Guardian*, July 15th) pointing out that patients had been accepted on a contributory basis since the hospital opened in 1870, and that the staff received a proportion of the maintenance charges on certain types of case. They gave notice that unless the staff's demands were withdrawn by July 20th applications would be invited for a resident surgeon and a consultant. At this stage a round-table conference was called by the Mayor of Barrow, and the delegates of the two parties eventually agreed on a basis of settlement. At the beginning of this week, however, no complete agreement had been reached.

Ophthalmic Treatment

The People's League of Health has passed a resolution commending to public attention the scheme of the National Ophthalmic Treatment Board, "under which persons insured under the National Health Insurance Acts, their dependents, and other persons of like economic status, can obtain for a small and inclusive fee advice and treatment for visual or ocular disorders from a qualified medical practitioner, with spectacles when these are required dispensed by an expert optician." The address of the Board is 1, High-street, London, W.1.

Extension of Harlow Wood Orthopædic Hospital

Since this Nottinghamshire institution was opened in 1929 it has treated 936 patients. A new ward block, making three altogether, has recently been opened by Mr. Samuel Brown, on behalf of the Ollerton Miners' Sick and Accident Club, representing the miners of the district. The new building has accommodation for 40 beds.

Collation of Chemical Publications

In order to coördinate the work of national institutions engaged in classifying and rendering accessible the publications of chemical investigators, the International Office of Chemistry was established in 1932 with headquarters in Paris. Its first act was the summoning of a conference of experts, and these have recommended that the three principal tasks of the office should be: (1) to make accessible to all interested persons the documents already accumulated in the various centres, depôts, and collections; (2) to guide the course of chemical documentation in such a way as to facilitate registration, filing, and diffusion; (3) to ensure coördination between the documentation of chemistry and that of other branches of science. The address of the Office is 49, rue des Mathurins, Paris, VIIIe.

Appointments

MACKINNON, W. D., M.B., Ch.B. Edin., has been appointed Medical Referee under the Workmen's Compensation Act, for the Portree Sheriff Court District (Sheriffdom of Inverness, Elgin and Nairn).

Vacancies

For further information refer to the advertisement columns

Bagdad, Royal College of Medicine.—Six Professorships.
Bangor, Caernarvonshire and Anglesey Infirmary.—Jun. H.S. £100.
Barry Surgical Hospital.—H.S. At rate of £200.
Belfast, Mater Infirmorum Hospital.—Radiologist.
Belfast, Queen's University.—John Dunville Research Fellowship in Experimental Pathology. £350–£500.
Birkenhead General Hospital.—Sen. H.S. £150. Also Second H.S., H.P., and Cas. O. Each at rate of £100.
Birkenhead Infirmary.—Res. M.O.'s. Each £300.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.
Bootle General Hospital.—H.P., 2 H.S.'s, and Cas. O. Each at rate of £150.
Bradford, Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each at rate of £150.
Brentwood, Essex, High Wood Hospital.—H.P. At rate of £80.
Bristol General Hospital.—H.P. At rate of £80.
Buxton, Devonshire Hospital.—Asst. H.P. At rate of £175.
Carlisle, Cumberland Infirmary.—H.S. At rate of £175. Also H.P., Second H.S., and H.S. to Spec. Depts. Each at rate of £155.
Cheadle Royal, Cheshire.—Asst. M.O. £350.
City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.
Derby, Derbyshire C.C.—Asst. Maternity and Child Welfare M.O. £600.
Doncaster Royal Infirmary.—H.P. Also Two H.S.'s. Each at rate of £175.
Durham County Mental Hospital.—Asst. M.O. £350.
Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £120.
Exeter City.—Deputy M.O.H. and Asst. Tuber. O. £600.
Great Yarmouth General Hospital.—H.S. £140.
Ilford Borough.—Asst. School Dental Surgeon. £450.
Ilford, King George Hospital – H.S. £100.
Leeds General Infirmary.—Hon. Ophth. Surgeon.
Liverpool Royal Southern Hospital.—Orthopædic H.S. and M.O. to Special Depts. and Res. Anæsthetist. Each at rate of £60.
Liverpool Sanatorium, Delamere Forest, Frodsham.—Asst. to the Med. Supt. £250.
Liverpool, Walton Hospital.—Res. Asst. M.O.'s. Each £200.
Macclesfield General Infirmary.—Second H.S. At rate of £150.
Manchester, Baguley Sanatorium.—Jun. Res. M.O. £300.
Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Hon. Consulting Thoracic Surg.
Manchester, St. Mary's Hospitals.—H.S. for Whitworth Park Hospital. At rate of £50.
Manchester and Salford Hospital for Skin Diseases.—H.S. At rate of £100.
Middlesbrough, Holgate Municipal Hospital.—Jun. Res. M.O. £170.
National Hospital for Diseases of the Heart, Westmoreland-street, W. Res. M.O. At rate of £150.
Newcastle-upon-Tyne, Royal Victoria Hospital.—Res. M.O. £350.
Nottingham General Hospital.—H.S. for Ear, Nose and Throat Dept. At rate of £150.
Plymouth City Hospital.—Res. M.O. £350.
Preston and County of Lancaster, Queen Victoria Royal Infirmary. H.P. £150.
Preston and County of Lancaster Royal Infirmary.—Asst. Radiologist. Also H.S. £150.
Preston, Sharoe Green Hospital.—Jun. Res. M.O. At rate of £100.
Princess Beatrice Hospital, Richmond-road, Earl's-court, S.W.—Sen. Res. M.O. £150.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Dist. Res. M.O. Also Asst. Res. M.O. Each at rate of £80.
Queen's Hospital for Children, Hackney-road, E.—H.S. and Cas. O. Each at rate of £100.
Rhondda U.D.C.—Asst. M.O. £500.
Richmond, Surrey, Royal Hospital.—Jun. H.S. At rate of £100.
Royal College of Physicians, Pall Mall East.—Milroy Lecturer.
Royal College of Surgeons of England.—Conservator.
Royal Eye Hospital, St. George's-circus, Southwark, S.E.—H.S. and Asst. H.S. At rate of £150 and £100 respectively.
Salisbury, General Infirmary.—H.P. At rate of £150.
Shrewsbury, Royal Salop Infirmary.—Res. H.P. At rate of £160.
Southampton Children's Hospital and Dispensary for Women.—Res. M.O. At rate of £150.
Southampton Civic Centre.—Antenatal M.O., &c. At rate of £300.
South Shields, Ingham Infirmary.—Sen. and Jun. H.S.'s. £200 and £150 respectively.
Sudan Medical Service.—M.O. £E.720.
Swansea, Infectious Diseases Hospital.—Res. M.O. £350.
Walsall County Borough.—Asst. M.O. £600.
Walsall General Hospital.—H.S. At rate of £150.
Winchester, Royal Hampshire County Hospital.—H.S. At rate of £125.
Weston-super-Mare, General Hospital.—Res. M.O. £150.

Births, Marriages, and Deaths

BIRTHS

ARCHER.—On August 3rd, at a London nursing-home, the wife of Basil Crowhurst Archer, M.D., of Harley-street, and Hamilton-terrace, N.W., of a daughter.

FOX.—On August 9th, in London, to Margaret and T. F. Fox—a son.

HOPKINS.—On July 30th, at St. Clement's, Exmouth, Devon, the wife of Dr. U. M. Hopkins, of a daughter.

MARRIAGES

BOAKE—BERRY.—On August 1st, at Coulsdon Old Church, Surrey, Haltier William Boake, M.R.C.S., L.R.C.P., to Elizabeth Mary, only daughter of Mr. and Mrs. C. John Berry, of Fairfields, Purley, Surrey.

DEATHS

CLAPHAM.—On August 3rd, at Madeley House, Park-road, Peterborough, Harold Clapham, M.R.C.S., L.R.C.P., aged 51 years.

HILL.—On August 1st, at Globe-road, E., Isabel Hill, M.B., Ch.B. Edin.

MALLORY.—On August 4th, suddenly, at Edinburgh, Fred Rous Mallory, L.D.S., D.D.S.

ROE.—On August 2nd, at St. Thomas's Hospital, Arthur Dumville Roe, B.A., M.B. Camb., M.R.C.S. Eng., of Rosend, Bookham.

SMITH.—On August 3rd, at Glebe-road, Cambridge, William Alexander Smith, M.A., B.M. Oxon., F.C.S., in his 81st year.

TROTTER.—On August 5th, at Bishopsgarth, Stockton-on-Tees, Walter Octavius Trotter, M.R.C.S., L.R.C.P., J.P., aged 75.

TURNBULL.—On July 27th, at the British Military Hospital, Ranikhet, India, Colonel John Archbold Turnbull, D.S.O., late R.A.M.C., Assistant Director of Medical Services, Meerut District.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE BICENTENARY OF THOMAS DENMAN

AT Holme Hall, Bakewell, the residence of Mr. E. L. Hoyle, there was exhibited on July 21st a tablet provided by British obstetricians to commemorate the bicentenary of the birth of the famous obstetrician Thomas Denman. This tablet, a facsimile of which appears below, is to be placed in the parish church at Bakewell where he was born. Dr. Herbert Spencer, on the occasion of its public exhibition, delivered the following brief address on Denman's life and work.

Dr. Spencer's Address

This tablet commemorates the bicentenary of the birth at Bakewell of Thomas Denman, M.D., who by the time he was 50 years of age was the most distinguished and esteemed of British obstetricians, and who maintained his pre-eminence up to the time of his death in his eighty-third year. The second son and third child of John Denman, an apothecary, he was born at Bakewell on June 27th, 1733. Besides

a son, Thomas, who became Lord Chief Justice of England and was raised to the peerage as Lord Denman of Dovedale in 1834, he had twin daughters, who married distinguished physicians, the first-born becoming the wife of Dr. (afterwards Sir Richard) Croft, and the second the wife of Dr. Matthew Baillie.

In an autobiographical memoir, written in 1779, which appeared after his death, with some additions by his son-in-law Matthew Baillie, he divided his life into three periods—his home life till he was 21, his service as a naval surgeon from the age of 21 to 30, and his life as an obstetrician from the age of 30 till his death. The first period he spent entirely at home, proving a marked exception to the generalisation of the Gentleman of Verona that "home-keeping youth have ever homely wits." He was educated at the Free School at Bakewell, and, up to the age of 21, he tells us he had never been away from home for a week, living on a homely diet and hardly ever out of bed at ten o'clock at night, a hungry, sharp-set lad with some learning, tolerably well informed in the Latin tongue and understanding some Greek. He also had a "very competent knowledge of pharmacy and knew as much of the diseases as the frequent reading of Sydenham's works and a few other books could give him."[1] His father having died in 1752, Thomas assisted his brother Joseph in the practice of apothecary to which Joseph had succeeded, and in September, 1754, became a medical student at St. George's Hospital, London, paying 10*s.* 6*d.* a week for board and lodging at a hairdresser's in Dean-street, Soho, who he says had a hard bargain. The money (£75) which he had brought with him to pay the hospital fees and for two courses of anatomical lectures which he attended very assiduously, was wholly expended in six months. He therefore had to get some employment for his immediate support, and on April 3rd, 1755, he passed as surgeon to a ship "of sixth rate."

During the succeeding nine years (the second era of his life) he served as surgeon's mate or surgeon on ships engaged in the wars with France and Spain. These nine years were full of adventure and not free from danger. Denman was serving on the flag-ship *Ramillies* in which Admiral Byng made his unfortunate attempt to relieve Minorca, and was surgeon on the *Edgar* (Captain Blake) when the English, under Boscawen, captured the French ships *Centaur* and *Temeraire*. At the siege of Belleisle—like Harvey at the battle of Edgehill—Denman was very near being killed by a cannon-shot. And even more dangerous than the shots of the enemy were the unhealthy berths and billets of the sailors; no less than one-sixth of the men of the *Edgar* died at the siege of Havannah from disease, which affected also Denman, so that he was "too ill to enjoy our meeting with eight or ten sail of merchant ships and taking them prizes." During the earlier part of his naval career he was occasionally in financial straights, sometimes not having a penny in his pocket; and even when his share of prize money put him in funds he was apt to spend it during his shore-leave. Gradually, however, he learned to be frugal (on the necessity of which he insists in his memoir) and to steady his naturally impetuous disposition, steadiness being in his opinion worth every other quality, either in man or woman. When the *Edgar* was paid off he was possessed of more than £500, at the end of the second period of his career, which he describes as a wandering, though not in general a disagreeable life.

Returning to Bakewell and his friends in 1763 he found a great alteration in them and in his own sentiments. He determined to apply himself to the study of anatomy and midwifery. After a short unsuccessful attempt to make a practice at Winchester, which cost him £200, he came to London, obtained the M.D. degree of Aberdeen University in 1764, and commenced practice, at first in rooms and then, on the strength of his salary (£75) as surgeon to the royal yacht, took a small house in Oxendon-street, Haymarket. He was then free from debt; but excepting his furniture, he had but 24*s.* in the world. From that time onwards, however, his practice and position as an obstetrician rapidly increased. In 1769 he was appointed man-midwife to the Middlesex Hospital, the first British general hospital to have lying-in wards, a post he held till his resignation in 1783. By conducting lectures on midwifery, with his friend Dr. Osborn, he got upwards of £300 a year. In 1770 he married Elizabeth Brodie, to whose virtues he gives affectionate testimony in his memoir. In this year he earned £650 and now removed to a large house in Queen-street, Golden-square. He was the first to obtain the diploma of Licentiate in Midwifery instituted by the Royal College of Physicians in 1783. The death of Dr. William Hunter in the same year raised him at once into the highest practice and placed him at the head of his branch of the profession. The house in Queen-square was burnt out in 1781, when the life of his little son was saved by the father's presence of mind and determination, and he subsequently moved his address to Old Burlington-street and finally to Mount-street, Mayfair. Here he died suddenly on Nov. 26th, 1815, and was buried in St. James's Church, Piccadilly, where a simple marble tablet is erected to the memory of himself and his wife. This is not an occasion for detailed consideration of Dr. Denman's works,[2] some of which obtained wide

[1] Introduction to the Practice of Midwifery, 7th ed., 1832.

[2] History of British Midwifery, 1650–1800. By Herbert Spencer.

popularity and were translated into foreign languages; but it may be stated that, in addition to an admirable historical account of the work of ancient and contemporary writers on obstetrics, he made many original observations and introduced new methods of treatment which have stood the test of time, and his advocacy of patience and gentleness in the management of normal labour was as valuable then as now. His writing is characterised by sound judgment, honest statement, and lucid expression, often illuminated by much learning. His literary reputation rests firmly on his "Aphorisms," which deservedly maintained its popularity for more than 50 years, and his "Introduction to the Practice of Midwifery," of which seven editions were published. The quarto edition of this work (1801) is one of the most splendid works on the subject in the English language, whether regarded from the point of view of format, paper, printing, and illustration of the book, the learning and knowledge it exhibits, or the ordered and judicial manner in which that knowledge is presented.

Of Denman's character a pious account is given by his son-in-law, Matthew Baillie, who states that he had an ardent curiosity after knowledge, perfect integrity and great benevolence of disposition, which was not chilled by the progress of age, but was mixed to the last with all the cheerful animation which belongs to youth. His habit of early rising afforded him many hours of leisure, which were always actively employed, for he regarded idleness as the root of all evil. In one of his voyages he taught himself French. He did a great deal of miscellaneous reading, especially of the English classics, Bacon being a favourite author and Shakespeare his constant companion and daily study. Baillie states further that his father-in-law was religious, but free from dogmatism or bigotry; fond of society and interested in the sports and amusements of the young; personally moderate and abstemious, though generous and bountiful to those in distress; of a sweet temper and agreeable in conversation; respected and loved by his family and friends. "In his person he was firm and strongly made, about 5 ft. 8 in. in height. His hair was perfectly white, his complexion fresh and vigorous, his eye, which was blue, continued remarkably clear and bright, his hearing was unimpaired, and his teeth remained entire to the very last. Such he was in the eighty-second year of his age."

The suggestion of Dr. Miles Phillips to commemorate the bicentenary of the birth of Thomas Denman at Bakewell has been cordially received by British obstetricians, who have provided the tablet which I have the pleasure of exhibiting.

Lord Denman, who brought to the meeting a fine painted portrait of his ancestor, thanked Dr. Spencer for his address in the name of the meeting.

Dr. Miles Phillips read a list of universities, colleges, and obstetrical societies represented at the meeting.

Lady (Joh. Emmott) Barlow showed some manuscript records of her ancestor, and some pharmacy pots which belonged to his father were also exhibited.

SCOLIOSIS AND ITS TREATMENT

SCOLIOSIS has engaged the attention and taxed the ingenuity of successive generations of orthopædic surgeons. The deformities due to congenital or pathological conditions of the bodies of the vertebræ are not difficult to understand, but the ætiology of the large group labelled "idiopathic scoliosis" is still far from clear. Philip Lewin [1] says that a working model, made by Carey, showing the anatomical and physiological relations of muscles and bone-levers in the normal back, enabled him to visualise the normal and abnormal equilibrium of the musculature of the body. He found that with only 13 pairs of spinal muscles there were no fewer than 67 million possible combinations of muscle imbalance, and he concluded that idiopathic scoliosis is probably a result of the unbalanced action of bilateral antagonistic muscles, due to malnutrition during the first decade of life.

Lewin gives a brief description of the Galeazzi method of treating scoliosis. After a preliminary period of intensive mobilisation to make the back as supple as possible, the deformity is corrected by means of special apparatus. This apparatus consists of two units: one for the pelvis and one for the shoulder-girdle, and each unit permits movement on a horizontal and vertical axis. The patient is placed on a platform within the apparatus with the trunk horizontal and hips and knees flexed (the quadruped attitude); the pelvis and the shoulders are secured to each unit by a plaster section. A bandage is placed over the convexity of the curves and held firmly by assistants to act as fulcrum; the units are then manipulated so as to deflex and derotate the curves of the back. When the desired degree of correction has been obtained, the two plaster sections are joined together by a plaster bandage. The casts are changed every three months over a period of 18 to 36 months. Lewin shows pictures and radiograms of one of Galeazzi's patients in whom a remarkable degree of improvement was obtained; but though he speaks in high terms of this method of treatment, he mentions as disadvantages the cost of the apparatus, the long period of preliminary preparation, the difficulty of applying the plaster, and the length of the after-treatment required.

[1] Surg., Gyn., and Obst., 1933, lvi., 79.

A DEVICE TO MASK LEG SHORTENING

FROM an æsthetic point of view, a new device, known as the Incelcas Improved Foot Elevator, for use in cases of shortening of one leg, has distinct advantages over a surgical boot with a cork inlay, since it is worn with ordinary boots and shoes. It is a light appliance (average weight 5 oz.) worn under the sock or stocking and made of non-inflammable celluloid moulded to the foot and also to the shoes with which it is to be worn. It is invisible under a trousered leg, and certainly far less obvious when worn with a short skirt than is a surgical boot.

The only difference in the shape of the foot and ankle viewed from the side is a slight bulging above the upper rim of the shoe behind made by the casing in which the actual heel of the wearer rests. For severe degrees of shortening, say over 3 in., the fact that there is no block under the toes but only under the heel and instep would mean that the foot in walking would be too steeply inclined downwards for comfort, but for slight degrees of shortening, which are still too great to be compensated for merely by a higher heel in one shoe, this device would seem to merit trial, as it allows more freedom of movement to toe-joints than does a surgical boot. The material is non-absorbent and hence easily cleaned; it can also be repaired at small cost. The device is obtainable from the manufacturers, Incelcas, whose fitting-room is at 16, Cosway-street, Marylebone-road, London, N.W.1.

HOSPITAL FLOORING

THE question of suitable flooring material for the wards of hospitals is a perplexing one, and still largely unsolved. It is discussed at length in a report on hospital construction presented by a British sub-committee, over which Mr. C. Ernest Elcock presided, to the third International Hospital Congress, and published in *Nosokomeion*. This committee was guided in general by the admirable sentiment:

"... it should be remembered that the primary reason for the existence of the unit, and indeed of the whole hospital, is the treatment of sick persons in such a manner as to ensure early convalescence."

But in the matter of flooring it seems to have lost its concern for the patient, and to be carried away by considerations of durability and appearance. What qualities do the patient and (an important second) the nurse ask of the ward floor? In the first place it should be silent. It should not re-echo eternally to the tap of the nurse's heels, the tramp of the house surgeon, or the pontifical tread of the matron. In the second place it should not have a surface which by any process known to woman can be polished. A smooth surface seems to act like a dark charm upon ward sisters; floor polish is freely expended, and nurses and doctors skid about their duties over a surface as dangerous as polished glass.

When a patient at the far end of the ward starts a secondary hæmorrhage, the nurse has to approach him with the skill of an expert skater, which certainly adds to the excitement but hardly furthers the interests of the patient. Linoleum is unsatisfactory because it can be polished; the subcommittee dislike it because it tends to rise from the floor and gets worn at the joints. Cork lino is too soft for bed traffic. Rubber is useless unless more than five-sixteenths of an inch thick, and then it is expensive; the subcommittee think it satisfactory for use in corridors and operation theatres, but make no mention of its use in wards. Why not? Here is a material which is soundless to tread and which cannot be polished; surely it repays the initial outlay? But no explanation is given for its rejection. Tiles are noisy; terrazzo can be polished, and, moreover, it is often laid out in sections divided by strips of brass, which are presumably as unsympathetic to the misapplied heel as a series of banana skins. Cement is dusty as well as noisy; asphalt, we are told, "is quiet and cheap but has not a very good appearance." Does that matter? Composition, made of cement and sawdust, has several disadvantages, the chief being that it will not stand wetting. And so we come to wood block floors—teak for choice—which the subcommittee think very suitable for use in wards, regardless of the drawbacks of noise and polish which are its inevitable companions. The ideal floor covering has yet to be invented.

HOLIDAYS FOR WORKING GIRLS

THE following letter reaches us from the Factory Girls' Country Holiday Fund: "Will you allow us to make a very urgent appeal on behalf of this fund? Started many years ago in central London at Saffron Hill, it ministers now to girls and women living and working as far apart as Stratford and Battersea. A visit to one of the many factory girls' clubs scattered all over London, where these girls and women assemble and bring week by week, for months, their own small contributions, often a few pence, towards a holiday ardently longed for as a rest from monotonous work, and a change from the lifeless air of crowded homes, would touch the hearts of anyone more fortunate. A visit to the headquarters of the fund on a Saturday in July and August, the months in which the greater number of girls and women are sent away and come back, would convince a thorough sceptic of the real utility and value of our work. The fund aims at helping those who seek to some extent to help themselves, and at arranging a fortnight's holiday for them. This year, unfortunately, many of the girls and women, owing to lack of employment among other members of their family, cannot hope to have more than one week, unless the response to our appeal is exceptionally generous. Our organisation in the course of years has become very complete. We have ready and waiting hundreds of homes with kindly cottagers who will welcome their visitors and do their utmost to make them comfortable and happy. We have many experienced voluntary workers who place their services at our disposal, make all necessary arrangements, and take a friendly interest in the visitors as they come week by week. Our old subscribers have stood by us nobly through many difficult years. We are asking for more support from the kindly general public, and we do so in the confident hope that, bad as times are for most of us, they will not allow our girls and women to go without the little rest and change they need so much. Subscriptions and donations will be thankfully received and acknowledged by the hon. treasurer, Mrs. Slater, or Miss Mary Canney, 75, Lamb's Conduit-street, London, W.C.1."

This appeal is signed by Sir Thomas Barlow, the Bishop of London, Lady Sandwich, Mrs. Creighton, Miss Lilian Braithwaite, the Rev. R. F. Horton, the Chief Rabbi, Lady Loch (chairman), and Mrs. Slater.

BRADSHAW'S CONTINENTAL HANDBOOK.—The new edition of this well-tried handbook, revised by competent authorities all over Europe, may be of great value to the traveller. It claims to be the only guide book in print which can inform its readers of the topographical and other changes which have taken place in some of the world's capital cities: in Rome, for example, in Madrid, in Barcelona and other towns in Spain, in Constantinople—now called "Istanbul," and elsewhere. Its summarised notes, at the introduction to each country, reflect their latest political development. For the tourist whose stay in a foreign country is limited to one place only there is not sufficient detail; but for touring, for globe-trotting, and last but not least, for those who seek information as to the remedial and medical qualifications of the thermal resorts of Europe, the book can be safely recommended. The price is 3*s*. 6*d*., from Bradshaw House, Surrey-street, London, W.C.2.

"THE EUGENIST."—On July 20th appeared the first number of a new journal with this title. According to its editor, the kingship is supreme in all matters of religious theory and structure; he gives prominence to an open letter addressed to the King, and he advocates the establishment of Royal Courts of Eugeny whose function will be to decide each eugenic problem as it arises. An official compulsory register is to be maintained of certain classes of unfit persons, whose marriage would be prohibited, unless consented to by these courts. Sterilisation by operation is opposed, and segregation is advocated instead. The editor of the *Eugenist* believes that Great Britain is steadily going insane, both absolutely and relatively, and that this is due to unnatural repressions of the normal impulses of the human race.

INDEX TO "THE LANCET," VOL. I., 1933

THE Index and Title-page to Vol. I., 1933, which was completed with the issue of June 24th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.